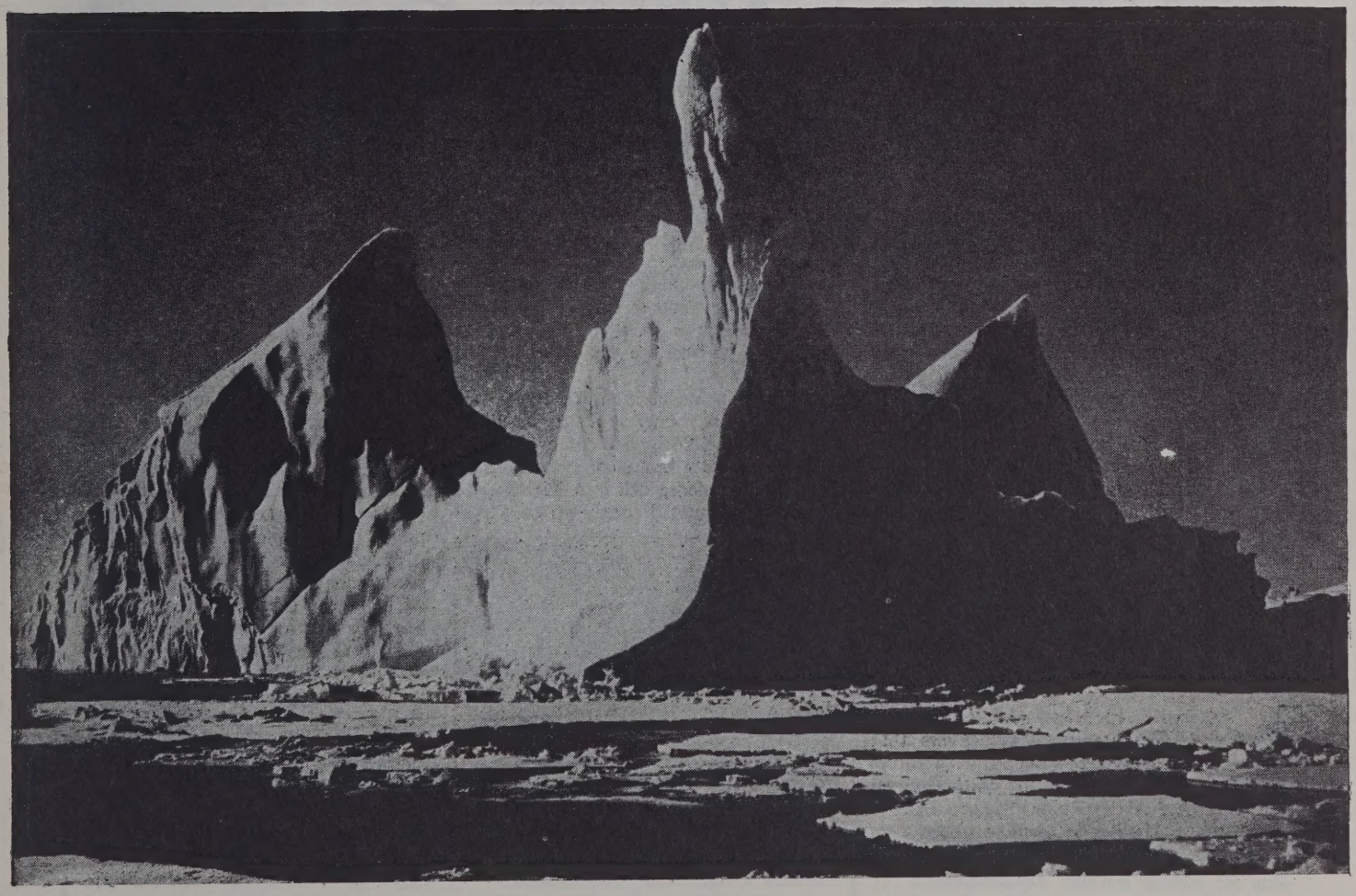
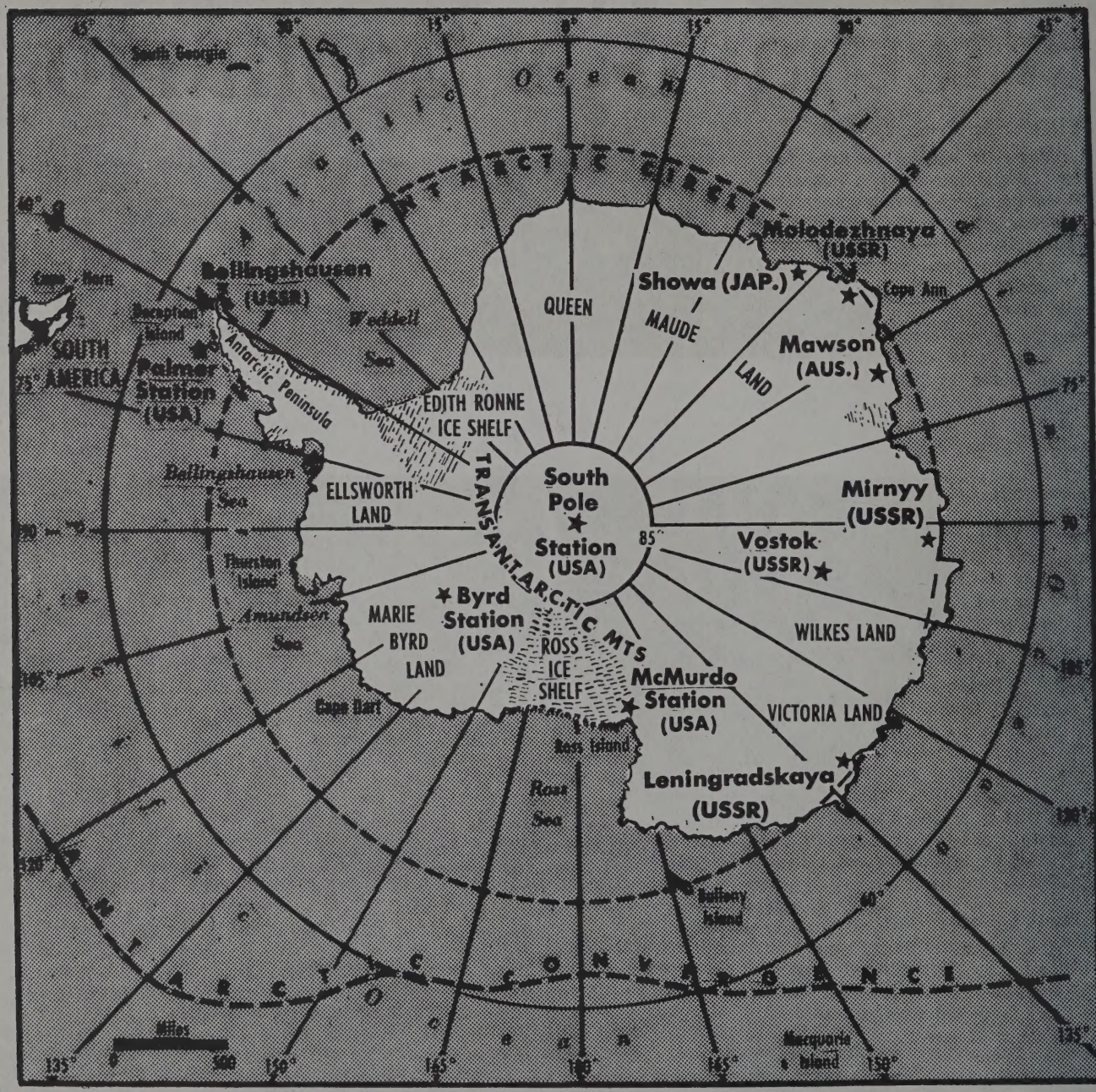
THE POLAR TIMES



Awesome icebergs, poking only a ninth of their mass above water, drift through Baffin Bay and Davis Strait into the North Atlantic.



By Joseph P. Mastrangelo—The Washington Post

The Polar Times

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No. 72 *JUNE 1971*

A Continent of Cooperation

By Joseph M. Dukert
The Washington Post

The second edition of the author's book "This Is Antarctica" will be published in November by Coward, McCann & Geoghegan.

June 20

IT'S IRONIC that the world-symbol of the United Nations shows only six of the earth's seven continents. The missing one—Antarctica—is the only continent that hasn't seen even a hint of hostilities, war preparations or unrest for years. The Antarctic Treaty, which set some significant international precedents, now links 16 Communist and non-Communist countries. The treaty will be 10 years old on Wednesday, and it has worked.

True, the Antarctic is out-of-the-way. Astronauts don't even get a look at it from the normal manned orbital paths, although picture-taking polar satellites cross it many times a day. Furthermore, 95 per cent of that rocky land mass at the southern end of the earth is covered year-round with snow and ice—some of it more than three miles deep. But remoteness and unfavorable climate aren't an automatic protection against wars or preparations for wars. The Mongolian wastes, Sinai and Bikini show that.

Nazi Germany and the Allies engaged in a little-publicized Antarctic campaign during World War II. Argentine forces fired on a British Antarctic landing party as recently as 1952. During the mid-1950s many people feared that the emptiness of the South Polar region would invite the establishment of a proving ground there for superweapons. After all, Antarctica has no native population to protest such a move, and neither the U.S. nor the Soviet Union has ever recognized any national territorial claims there.

But not everyone agrees on Antarctica's internationalization. Seven countries do maintain formal claims to parts of the Antarctic continent; and three of these (the Argentine, British and Chilean) overlap. That could easily have been a source of continuing friction, as explorers, scientists and tourists began to penetrate the earth's last long frontier. Yet during the decade since the Antarctic Treaty went into effect nobody has charged a single violation of its strict rules about "open skies," free access, information exchange, and complete dedication to peaceful uses. Old territorial claims have not been forfeited; but the treaty nations pledge not to make new ones before the 1990s or to base any future claims on activities they undertake while the treaty is in force.

THERE ARE NO combat troops or weapons of war in Antarctica. The only rockets are the kind that carry scientific payloads. All nuclear explosions — even peaceful ones — are banned. The principle of mutual, on-site inspection has succeeded there, in spite of the fact that the Russians have disdained to exercise it officially themselves; and the Antarctic model has contributed (modestly at least) to international agreements on space, oceanbeds, and nuclear nonproliferation. The somewhat stiff gestures toward "international scientific cooperation" which began during the International Geophysical Year of 1957-58 have blossomed in Antarctica into truly multinational, multidisciplinary projects.

The continent of Antarctica is bigger than the United States and Mexico combined, and the Antarctic Treaty extends even beyond the land boundary to include the entire area south of the 60th Parallel. It's a demilitarized zone that's never been rivaled, either in size or in effectiveness.

In February and March of this year, a six-man team of observers invoked for the third time the United States' right as a treaty signatory to inspect the bases and equipment of other nations in Antarctica. Before their circuit of the continent aboard a Coast Guard icebreaker was cut short by damage from a collision with an uncharted underwater peak, their official stops included scientific stations operated by France, Australia and the U.S.S.R. As anticipated, they found lots of hospitality and no trace of any treaty violation.

"We were sorry that we couldn't get all the way around," said Kenneth Kerst of the State Department, the U.S. team's leader. "The Russian in charge of Mirnyy Station had told us that he was sure his comrades at Molodezhnaya Station would be willing to delay their weekly rocket launching until we got there so we could watch it. And we were interested in seeing Showa too; the Japanese have published some magnificent pic-

Main Provisions of Antarctic Treaty

Forbids:

- "Any measures of a military nature."
- New territorial claims, or the basing of future claims on current activities.
- Nuclear explosions.
- Disposal of radioactive waste.

Requires:

- International exchange of scientists and scientific data.
- Free access to all activities for "observers" designated by any treaty power.
- Advance notice of scientific programs, expeditions and the use of any military personnel or equipment for peaceful purposes.
- Periodic consultations among treaty powers.
- "Appropriate efforts" to keep anyone (including non-members) from violating treaty principles.

Includes:

- All 12 nations active in Antarctica during the 1957-58 International Geophysical Year: Argentina, Australia, Belgium, Britain, Chile, France, Japan, New Zealand, Norway, South Africa, the U.S.S.R. and the U.S.
- U.N. members which accede to treaty terms, or other nations admitted by unanimous consent: Czechoslovakia, Denmark, the Netherlands and Poland.

Extends:

- Indefinitely, although a conference to review its operation may be called after June 23, 1991. In effect, the original signatories may not withdraw before 1995.

tures of that base and its surroundings."

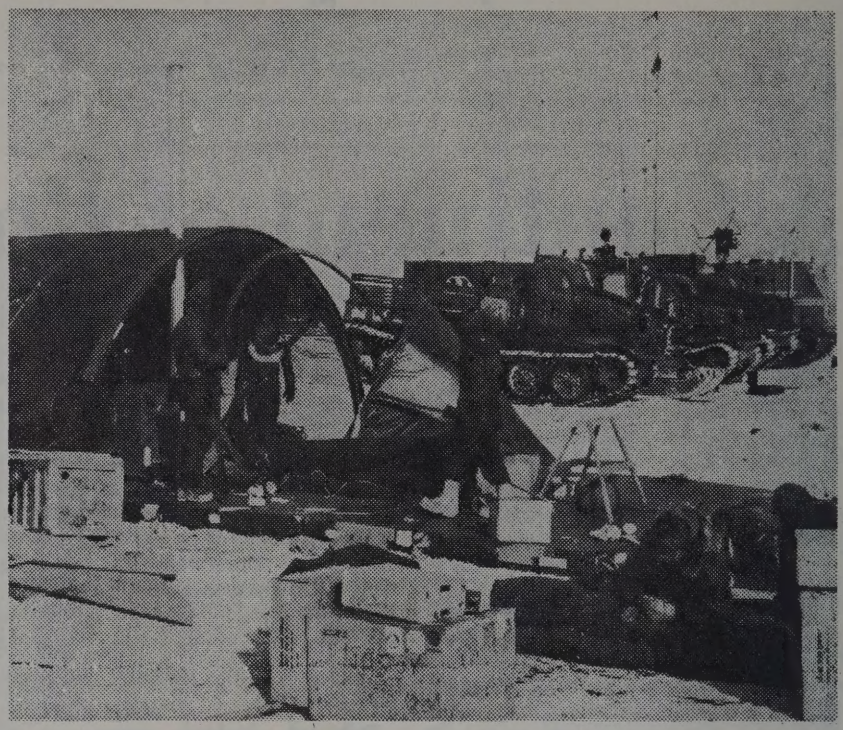
Most of the 30 or so quasi-permanent bases in Antarctica are located along the coast, where solid ground is exposed and where summer temperatures occasionally poke into the plus-40s. Most are small, but sturdily built. Several countries besides the U.S. have installed seawater desalination systems to counteract the chronic shortage of unfrozen water; and it's obvious from the reports of inspectors and other visitors that the nations active in Antarctica today intend to stay there.

Nevertheless, the continent at the bottom of the world is still an incredibly lonely place. Even counting the tourists who get ashore for a few hours (there have been more than 20 commercial cruises to the Antarctic during the past 13 years), no more than approximately 2,000 people have ever set foot on the continent at any one time. About half this number can be found each summer at McMurdo Station—the scientific headquarters and supply port operated by the U.S. Naval Support Forces at the edge of Antarctica's Ross Ice Shelf, 2,300 nautical miles south of New Zealand.

A Scientific Laboratory

AT PRESENT—with winter's 24-hour darkness covering much of Antarctica—the population of the whole continent consists of only 213 Americans, a couple of hundred Russians, and about the same number of all other nationals combined. A geophysicist from Leningrad is spending the winter doing research at the Americans' Byrd Station—which is tunneled into the deep ice hundreds of miles inland. In exchange, a scientist from our National Oceanic and Atmospheric Administration is living with the Russians at Vostok Station—a base on the Polar Plateau. He's operating upper atmospheric equipment at the point where the earth's converging magnetic force lines cause a concentration of cosmic rays, and, coincidentally, where the coldest temperatures on earth are recorded. The air at the snow's surface there has been measured at more than 125 degrees below zero; and temperatures of minus 100 are relatively common. Yet there's no cold war. In January, Vostok greeted Navy Under Secretary John Warner and a couple of U.S. admirals with flags of welcome, as well as vodka and caviar. The Navy brass had brought 200 pounds of fresh vegetables among the gifts on their flight.

The Antarctic Treaty allows nations to use members and equipment of their armed forces to carry out purely supportive roles; and until recently this country's National Science Foundation shared the budgeting and direction of its Antarctic program with the Department of Defense. But last fall President Nixon dramatized the scientific dedication of U.S. activities there by assigning full responsibility to NSF alone, starting with the 1971-72 season. There's little doubt that U.S. scientists going to Antarctica will continue to rely on Coast Guard icebreakers, Navy Seabees and Air Force jet transports; but the current military-civilian ratio of 9 to 1 among Americans in Antarctica may well change. NSF is likely to reevaluate its entire logistical approach now that it controls the full Antarctic budget request.



U.S. Navy photo

U.S. crew leaving Soviet Vostok station after building antenna.

Scientifically, Antarctica's true importance is just beginning to be realized. Before the IGY, only 10 men had ever stood at the South Pole; and barely more than a hundred years had passed since a number of respected Americans (including some congressmen) insisted that there was nothing but a continent-sized hole at each end of the globe, leading down into the earth's interior. Studies in Antarctica during the first 15 or 20 years after World War II were highlighted more by isolated, nearly random discoveries than by systematic, purposeful research. Justifiably, the incredible expansion of human knowledge about the mysterious Antarctic came from an adventurous, "because-it's-there" motivation. But attitudes have changed.

Scientists interested in worldwide phenomena like earthquakes, volcanism, continental movements, climate and pollution find Antarctica valuable now—both as a fresh monitoring post and as an undisturbed natural history book. Unlike the North Polar area, Antarctica also gives observers a stable platform from which to study the earth or the heavens—not an ice island, but a continent. And, finally, the environmental extremes of Antarctica offer natural conditions for such experiments as adaptation to cold, disruption of the normal day-night cycle, and human reaction to isolation.

The National Science Foundation is putting more stress generally on "research to meet social needs." In Antarctica it has been rewarded by the discovery of such things as an "anti-freeze protein" in fish blood, an antibiotic in penguins which prevents digestive problems, and new knowledge about the origin of weather patterns (even north of the equator). The National Aeronautics and Space Administration also decided that Antarctica's cold-but-arid "Dry Valleys" are enough like the Martian surface to use them in developing and testing the automatic "life seekers" for future planetary landers. The ancient and primitive micro-organisms which survive in these desolate Antarctic "oases" represent a lifestyle that might even have made it on Mars.

The whole decade of the 1970s is being devoted to a comprehensive study of the Antarctic icecap by scientists of the United States, France, Australia and the Soviet Union. Concentrating on about one-third of the continent, they'll make detailed aerial

surveys and then follow up on the surface by crisscrossing the enormous area with measuring stakes and other tools to determine movements and changes in the icecap. Because substantial melting of the Antarctic's ice would flood most of the world's major cities, this program is often cited as one of practical social value as well as a welcome advance in international cooperation beyond simple scientist exchanges.

A Russian glaciologist I talked with at McMurdo Station in January explained that many of Antarctica's secrets can be revealed only by integrating the results of many different studies. In trying to trace the ebb and flow of the area's prehistoric ice cover himself, he counts on evidence from geology, paleontology, meteorology and even oceanology, as well as the ice sheets he can study layer-by-layer.

Patterns for Cooperation

PERHAPS THERE'S something about the emerging Antarctic that's conducive to cooperation — among different fields of science, or even among different peoples. With luck, its spirit could be contagious.

Although the move to make U.S. and Soviet spacecraft compatible for docking maneuvers hasn't yet led to any exchange of astronauts and cosmonauts, it's conceivable that orbiting laboratories could be manned some day by international teams patterned after the Antarctic example. The same idea might be extended to exploration of the ocean floor—just as scientists from both sides of the Iron Curtain now work together on research ships traveling along the surface of Antarctic waters.

Hopes are waning at NSF, however, for Navy permission to use even an old and relatively unsophisticated nuclear submarine for Antarctic research at any time soon. There is no doubt that Nautilus or Triton would be more effective than the automatic devices which NSF now plans to send down hundreds of feet through broad drill holes to explore the underside of the Ross Ice Shelf. This glacial projection the size of France—and others like it—have blocked any close-up study of where and how the cold bottom-waters of the world's oceans originate. The flow of these waters produces all great fishing grounds, and such a research project offers practical values; but Admiral Rickover is reluctant to convert even the 17-year-old Nautilus into Antarctic research equipment—subject to detailed scrutiny by the Soviet Union, Poland and Czechoslovakia.

Instead, the Russians may become the first nation to use a nuclear vessel in the Antarctic by sending down their icebreaker Lenin or one of the two atomic icebreakers now under construction. Next season's Soviet expedition will almost certainly need a powerful escort ship to reach Cape Dart—an ice-locked area along the coast of Marie Byrd Land where they have announced their intention to set up a new station.

Cape Dart, which is almost due south of San Francisco, will give the U.S.S.R. at least one coastal station in each quadrant of the Antarctic Continent. The Indian Ocean sector is already the site of the Russians' Novolazarevskaya and Molodezhnaya stations. South of Australia and New Zealand are Mirnyy and Leningradskaya (a new station about 600 miles from McMurdo). Another Russian base —Bellingshausen—was established in 1968 on an Antarctic island below South America.

Unimpressed by recent Russian "expansionism" in the Antarctic, NSF is actually planning to reduce the number of permanently manned U.S. bases in favor of additional automatic stations and air-transportable "temporaries." Of course, the prestigious (and scientifically important) U.S. station at the geographic South Pole will remain. The old IGY structures there will be replaced in 1972 by a large aluminum geodesic dome, sheltering new buildings for a small computer-aided scientific staff. But the spacious ice-tunnel network of Byrd Station is housing a group this season for the last time. It's no longer considered cost-effective.

National Science Foundation photo

Scientists fill a balloon with helium to carry instruments used to measure intensity of cosmic rays at high altitudes.

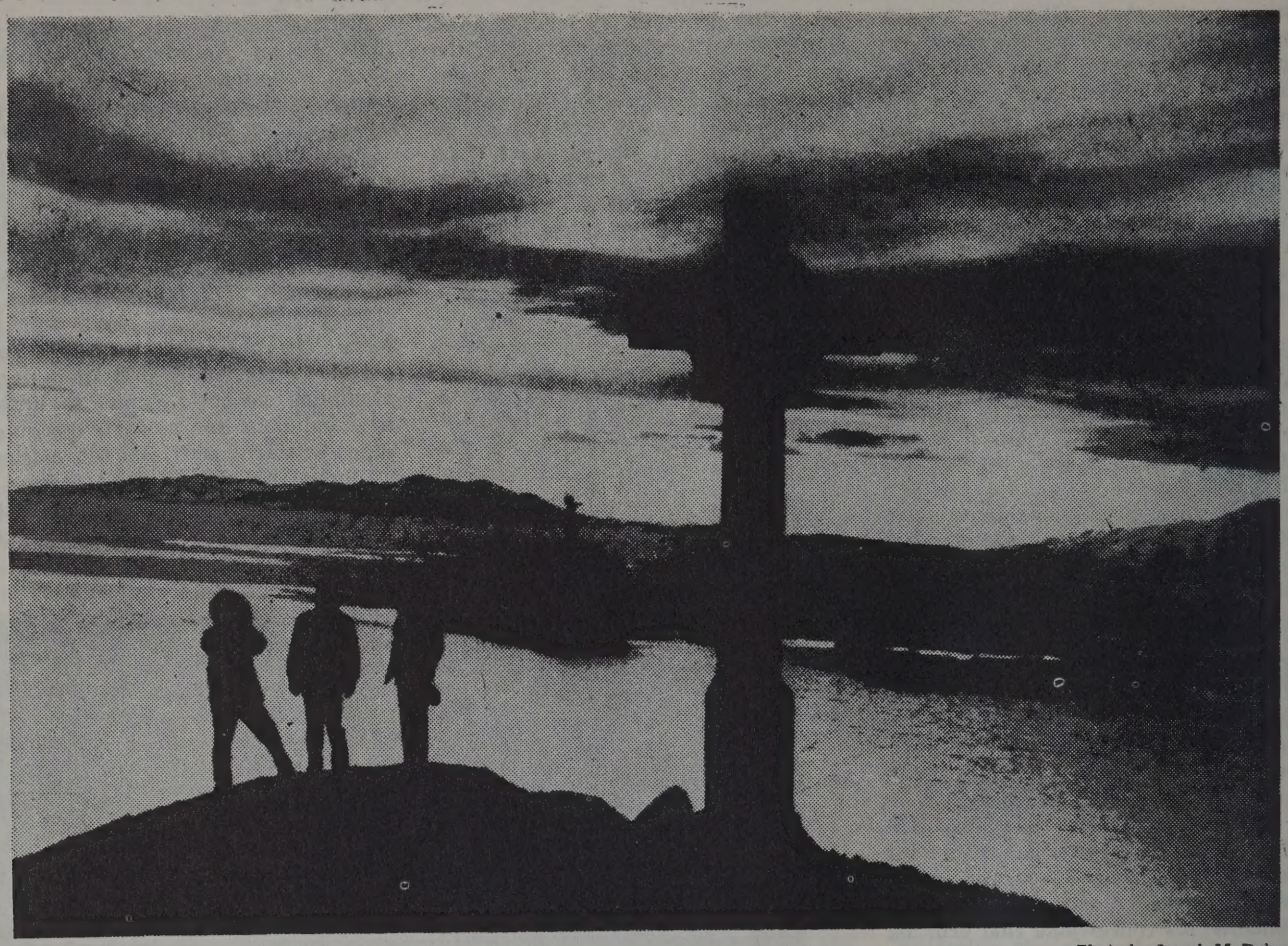


Photo by Joseph M. Dukert

A tour ship arrives at McMurdo, near cross marking where a sailor from the 1901-4 Scott expedition drowned.

The annual level of U.S. spending on its Antarctic program is expected to remain about the same as it has been for the past 10 years—roughly $35 million. But NSF's officials think that they can continue to improve its efficiency at least enough to offset the bite taken each year by inflation. Private contractors have already been given a limited opportunity to compete with military support forces in some tasks, and NSF planners have high hopes for applying a more businesslike "systems approach" to future projects. Still, the hardened and experienced Seabees don't require overtime pay or "hardship post" bonuses. And there's no commercial substitute at any price for certain service hardware, like the Navy's ski-equipped C-130s.

Commercial passenger flights to and through the Antarctic will probably be taking place regularly before the treaty celebrates its 20th birthday. Scandinavian Airlines has backed away from its idea of trying to link the southern continents in the near future by trans-Antarctic routes; but the ground rules are clear for tourist excursions and they seem economically feasible. The scenery in Antarctica is magnificent; the appeal to nature lovers, history hunters and those who simply enjoy the exotic is incomparable.

Commercial exploitation of Antarctica will involve problems, however. Sir Vivian Fuchs—the first man to lead a caravan all the way across the continent and now director of the British Antarctic Survey—has told me that visits by outsiders are "a disturbing influence on the men" and that small stations don't have enough manpower to watch out for tourists' safety. Biologists shrink in terror from the thought of careless feet trampling some precious lichen that took thousands of years to develop. Furthermore, an expanded population for Antarctica raises the risks of legal dilemmas like the recent one over an ice-island killing in the Far North.

Danger of Development

IN FACT, the greatest test for the Antarctic Treaty probably lies in some future argument over economic jurisdiction—possibly precipitated by tourism, mining or harvesting the fertile seas around the continent. Licensing and tax rights have been discussed very cautiously by delegates to the consultative meetings—and, so far, only after the official stenographers have stopped taking notes.

(Intriguingly, the only really new idea in the recent Russian proposal for more specific lunar agreements is to extend the existing ban on national sovereignties in space by forbidding individual property rights to moon territory. Any proposal to "communize" the Antarctic in this way, however, would undoubtedly meet vigorous opposition.)

Any large-scale project to tap Antarctica's mineral wealth in the near future is probably ruled out by operating costs and distance. Nevertheless, the chance discovery of an unusually attractive diamond deposit or platinum lode could spoil those economic projections and virtually force the treaty nations to agree somehow on who owns what. Scientific drilling in one area which is geologically "right" for such a long-shot strike will begin within the next couple of years.

As for ocean riches, Antarctic whaling is virtually dead. But Russian and Japanese fishermen are becoming increasingly enthusiastic about harvesting "krill"—the shrimp-like creatures which have multiplied with the disap-

pearance of the whales. Big blues used to gobble krill at a rate of up to three tons per day each. Now the protein-rich krill have become so plentiful that masses of red krill in some areas are reported to make the sea look like wine.

Seals—which were the part of nature's bounty which first drew men to Antarctica—have also become a target for exploitation in the '70s. Recommendations to regulate Antarctic sealing have been accepted at the consultative sessions, but the legislatures of the respective nations (including the U.S.) have shown little interest so far in making them effective.

Despite these patchy clouds, however, the horizon of the great international experiment in Antarctica is generally bright. A 10-year habit of such smooth cooperation tends to generate its own momentum. Perhaps, in fact, the Antarctic buffs who follow Admiral Byrd's tradition by mounting their office globes upside down (so that the Great White Continent shows prominently) are making a point. The view of our world from that angle is fresh and placid.

Scott Base leader

Major J. R. M. Barker, of Christchurch, has been selected as leader of the New Zealand Antarctic research expedition for the coming season. Last year he served as deputy leader for the summer season.

Major Barker has been seconded from the Army to the Department of Scientific and Industrial Research from May, 1971, to October, 1972, to enable him to accept the post. In his last posting Major Barker was second-in-

MAJOR BARKER

command of the 2nd Battalion, Royal New Zealand Infantry Regiment.

He joined the Regular Force in 1959 after service with the British Army and the Fiji Military Forces in Malaysia. He was posted to the 3rd Brigade Group in Christchurch in 1967.

Major Barker will accompany the superintendent of the Antarctic division (Mr R. B. Thomson) on his tour of New Zealand centres to interview applicants wishing to take part in this year's scientific programme in Antarctica.

6th Soviet Antarctic Post Is Set Up

The New York Times March 5, 1971

The Soviet Union has announced the establishment of its sixth permanent research station in the Antarctic, according to Moscow newspapers received here.

The new outpost, formally inaugurated last Saturday, is on Oates Coast, at Lat. 70 degrees S. and Long. 160 degrees W. The station has been named Leningradskaya, for the Soviet Union's second largest city.

According to the Russian news reports, Leningradskaya consists of 12 residential structures, a radio station, and generating plant as well as several research buildings.

The Russians are already operating Antarctic research stations at Mirny, coastal headquarters of their Antarctic program; Molodezhnaya and Novolazarevskaya, all on the coast, and Vostok, inland. A fifth outpost, named Bellingshausen, was established in May, 1968, on King George Island, 600 miles from South America's Cape Horn.

The Antarctic research program, in which the United States, Britain, Japan, France, New Zealand and other nations also participate, covers a wide range of fields, including geophysics, glaciology, geology, oceanography and biology.

Antarctic Expedition

MOSCOW (AP)—The Soviet research ship Akademik Knipovich has begun an eight-month voyage to the Antarctic.

Antarctic needs

The United States Navy Antarctic support force is for the first time expected to spend more than $1m on purchases in Christchurch this year.

The supply officer at the Navy base at Christchurch airport (Lieutenant-Commander J. P. Williams) said yesterday that this year's purchases will represent an estimated 20 per cent increase over last year's.

Commander Williams said that the normal types of purchases — as in previous years — will include all types of foodstuffs, beer, furlined slippers and the like.

What was new this year was that the Navy was buying its meat for the Antarctic bases in Christchurch instead of bringing it from the United States.

"We will be buying from 60,000lb to 65,000lb of meat, of which 57,000lb will be various grades of steak. Last year we bought 10,000lb of New Zealand meat and this was so successful that we decided to make the total purchase here this year," he said.

Another new local purchase this year is an order for about 23,760 running feet of timber valued at about $15,000.

"This will be used for additional construction either this summer or next around Winter Quarters Bay," said Commander Williams.

U.S., Soviets Study Antarctic

Reuter

CHRISTCHURCH, New Zealand, Dec. 21.—Soviet and American scientists will pool their knowledge this year in a study of part of the upper atmosphere at the Russian Antarctic base of Vostok, one of the coldest spots on earth.

Dale Vance, an American radio electronics engineer from the U.S. McMurdo base, will leave for Vostok Wednesday for a year's research.

new commander

Rear-Admiral L. B. McCuddin, a Navy aviator since 1942 and a holder of the Navy Cross and the Silver Star, has been appointed the seventh commander of the United States Navy Antarctic support force.

He will succeed Rear-Admiral D. F. Welch who commanded the force from June 19, 1969. Admiral Welch has a new assignment in the Pentagon as Assistant Deputy Chief of Naval Operations for Logistics.

No date has been set for the change of command ceremony, which will take place at the Washington Navy Yard where the Navy's Antarctic command headquarters is located.

Admiral McCuddin has commanded Carrier Division Three, including the nuclear-powered aircraft carrier, Enterprise, with the United States Navy's Seventh Fleet in the Pacific and South-East Asia since June, 1970.

Admiral McCuddin graduated from the University of Nevada. He was studying law at the University of Arizona when he was appointed an aviation cadet in the United States Naval Reserve in 1941. He was commissioned in 1942. His appointment as rear-admiral was on August 1, 1968.

The Admiral has served with various fighter squadrons and carrier air groups.

Early in 1966, while commanding the aircraft carrier Ranger off the coast of Vietnam, Captain McCuddin (as he then was) earned the Legion of Merit for "his personal dedication to the crew and his attention to the planning and execution of day and night aerial armed reconnaissance and interdiction air strikes" in North Vietnam.

REAR-ADMIRAL McCUDDIN

Admiral McCuddin has the Distinguished Flying Cross with Gold Star, the Air Medal with 10 Gold Stars, the Presidential Unit Citation Ribbon and the Navy Unit Commendation ribbon with bronze star, as well as 14 service medals that cover service in Asia and the Pacific during World War II, the Korean war and the Vietnam war.

Admiral McCuddin received his bachelor of laws degree at Georgetown University, Washington, in June, 1958. He is a member of the District of Columbia Bar.

He is married with three children.

The Polar Times

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are one dollar a year, which entitles members to receive THE POLAR TIMES twice a year.

Back issues are 50 cents each

U.S. Ship Hits Rock in S. Pacific

Reuter

CHRISTCHURCH, New Zealand, March 1—The U.S. Coast Guard icebreaker Staten Island has hit an uncharted rock and some of its compartments are flooded, officials reported here today.

The 5,250-ton vessel was headed for the Australian ice station Mawson when it hit the rock yesterday. There were no injuries. The ship remained with full power and does not need help, officials said.

The Staten Island left McMurdo Sound Feb. 14 to circumnavigate the Antarctic continent. The icebreaker will have to enter dry dock

U.S. Plans New Check On Bases in Antarctica

WASHINGTON, Jan. 7 (AP)—A United States inspection team plans to visit some Soviet and other foreign stations in Antarctica to make sure no one is violating the ban on military activity.

The State Department made plain that it did not suspect anyone of flouting the provisions of the 16-nation Antarctic Treaty barring military bases.

Washington sent inspectors to Antarctica in 1964 and again in 1967 under terms allowing for such inspections by treaty members.

Several other countries have also made inspections, but not the Soviet Union.

U.S. and Japanese Sign Fishing-Right Accords

TOKYO, Dec. 12 (UPI)—The United States and Japan have signed agreements, including an accord settling crab quotas in the East Bering Sea.

Under the pact, Japan would be allowed to continue long-line and trawling fishing operations in water within 12 nautical miles of the United States coast for two more years.

The agreement also designates three additional ports where Japan can transfer her catches and supplies. At present there are five ports in use by the Japanese.

Antarctic Treaty FDC

This is one of the three first day covers offered by the American Society of Polar Philatelists for the Antarctic Treaty commemorative to be released June 23 at Washington, D. C. Details are available from the society at Box 245, Lambertville, Mich. 48144

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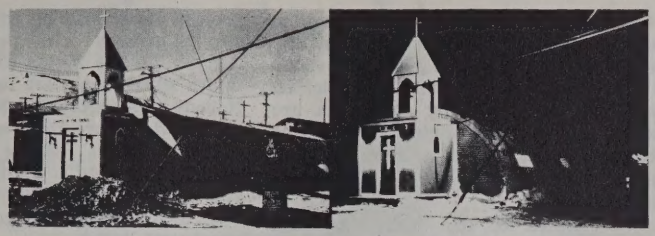


"Chapel of the Snows" at McMurdo Station in the summer (left) and winter

on ice-cap steeple

By Neal Stanford
The Christian Science Monitor
McMurdo Station, Antarctica

There is Chartres, and St. Paul's and the Church of the Presidents—and then there is the Chapel of the Snows.

Never heard of it? Never worshiped there?

Not surprising. It's the only church or chapel on an entire continent—no other competition within 5.5 million square miles. On a *good* night, as many as six persons will show up for its regular Wednesday evening meetings. Maybe 50 on Sundays.

As unique as it is isolated, it could well be the only church anywhere that takes no collection, asks no donations—and consequently has no money in its treasury.

But the Chapel of the Snows does serve a purpose. It helps the men isolated at McMurdo Station get through the long, cold winters at the South Pole. McMurdo is the supply base that supports United States science research programs at the Pole, Byrd Station, and other Antarctic installations.

Months of darkness

A glorified Quonset hut with a steeple atop, the Chapel of the Snows stands at one end of McMurdo's five-block-long main street, which is a dusty dirt road in summer. But come the Antarctic winter, darkness descends, the snow piles high, temperatures plummet, and McMurdo turns into a picturesque, frontier-town Christmas card.

Lights flood the chapel's steeple during the months of perpetual darkness, and lights from huts — with such imaginative names as Ross Hilton and Bunny Club — cast eerie shadows everywhere.

When I dropped in to visit Chaplain H. C. John Q. Lesher—a Navy lieutenant commander putting in a one-year stint at the bottom of the world—he was busy preparing for a service. A United Methodist, his services are nondenominational.

"One of my most important jobs is what is called counseling," he says, "Mail is a great morale booster. But when mail comes in, a lot of men get upsetting news from their families. They can't really do anything about it. So I keep busy talking it over with them. I usually arrange 'home patches' for them —that is, get them priorities for calling home by ham radio."

Mess hall competes

Chaplain Lesher says "hard work" whittles away at his congregation. During the dark winter days, he explains, only 200 men remain at McMurdo, and for them "it's a 10- or 12-hour shift and only six months to really accomplish anything."

Though golf courses and Sunday outings pose no competition to church services in Antarctica, the chaplain concedes he loses some men to the 24-hour mess hall serving four meals a day with no limit on how much the men can eat. And there are recreation rooms, a library, and movies to woo potential parishioners.

"But those who do come to our services really seem to enjoy it," he says. "You can tell by the way they sing. They really enter into it."

There are 1,200 men at McMurdo during the summer. The chapel only holds about 50. About 25 or so come to the Sunday Protestant service, another 25 or so to the Roman Catholic service. But it is not a recognized Mass unless a priest is present. One flies in from Christchurch, N.Z., two or three Sundays during the summer months. Other times the Catholic services are lay-conducted.

Making the circuit

"The last time Fr. Crawford, the priest from Christchurch, showed up," chuckled the chaplain, "I drew 25 to my service, he drew only 24. But actually it was a tie, for my 25th was Fr. Crawford, who played the organ for me."

Being chaplain at the Chapel of the Snows also means making the circuit—going to the Pole and Byrd Stations, when flying is possible to hold services. In addition to his roles as chaplain and counselor, Commander Lesher serves as librarian and guide for visiting VIPs.

Meanwhile, Chaplin Lesher's wife and two youngsters (Jack and Jill) live in San Diego, Calif. — as do many Navy families when their men are overseas. (His study is decorated with crayon drawings by his children.) Unique and rich in experience as 12 months in wind-swept icy Antarctica may be, few men stay here beyond their one-year assignment.

So, like the short Antarctica summers, chaplains come and go quickly at the Chapel of the Snows.

U.S. TO STOP KILLING OF WHALES BY 1972

WASHINGTON June 26 (UPI) —The United States will stop killing whales and halt the import of whale products after Dec. 31, a high State Department official has said.

U. Alexis Johnson, Under Secretary of State for Political Affairs, made the strongly worded statement on Monday at a closed meeting of the 14-nation International Whaling Commission.

Mr. Johnson also accused the commission of not adequately protecting whales and he expressed concern over the rate at which they were being killed.

"In less than a year from now, the United States will no longer be a whaling nation nor will we use whale products produced by other nations," Mr. Johnson told the delegates.

Failure of the commission to protect whales from hunters undermines "the whole concept of the multilateral international commission as an effective means of dealing with the conservation of major, living marine resources," Mr. Johnson said.

A Seal Hunter Drifts Home Following Five Days on Ice

GODTHAAB, Greenland (UPI)—A 20-year-old seal hunter spent five days on a drifting ice floe before reaching the coast 130 miles from home.

Albert Lukassen told the inhabitants at the settlement of Ejland on Greenland's west coast, he had left his home in Satut to set his nets.

When he was reported missing, a rescue party dynamited its way out of the Satut harbor in a lifeboat and radioed for plane assistance from the Sondre Strom Fjord Air Base.

"I heard the plane and saw light in the horizon, but was helpless because I had used all my matches," Mr. Lukassen said.

All-Eskimo Jury Acquits Defendant

RANKIN INLET, North West Territory, April 18 (AP) —A six-member, all-Eskimo jury acquitted Joachim Kavik of a rape charge here.

Chief Justice William G. Morrow of the territorial court said it was the first time in Canada that an all-Eskimo jury was chosen to try an Eskimo.

Public Spending, Hunt For Minerals Change Life in Icy Greenland

* * *

Igloos and Kayaks Give Way To Apartments, Outboards; Watch Out for Hungry Dogs

By RAY VICKER
THE WALL STREET JOURNAL

GODTHAAB, Greenland—Erik the Red was right.

He founded a Viking colony on this ice-bound island in the year 985. A PR man at heart, Erik decided to name the land Greenland—though there wasn't anything green in sight. "Give a place a good name and people will come to it," he observed, or so legend has it.

For nearly 1,000 years nobody was fooled. The island remained desolate and forgotten. But now things are beginning to change here, and a viable economy is emerging from one of the world's most inhospitable regions.

Open-handed spending by Denmark, the motherland of Greenland, is spurring the island's development. The Danes are pouring $85 million a year—up fourfold from their spending in 1960—into a cradle-to-grave welfare program for Greenland's 40,000 people, most of whom are of Eskimo extraction. The money is going to aid schools and hospitals, support a housing program and subsidize an expanding fishing industry. In little more than a dozen years the land's population has nearly doubled, thanks to improved sanitation and medical care.

Besides the help from the Danish government, oil and mining companies are seeking to tap Greenland's mineral wealth. Two American oil concerns launched offshore exploration operations here in late summer, and a dozen others have recently been granted exploration concessions. Some oil men think Greenland and its waters may have the same geological structure as Alaska's North Slope, the site of rich oil finds in recent years. Mining companies are scouring Greenland for uranium, cryolite and molybdenum, which are known to exist here in large quantities.

Snow in the Summer

But development of this forbidding land isn't easy. The weather is terrible. This year's late summer storm brought 10 inches of snow. Heavy snows cut off many communities from the outside world for five months each year. And the sun disappears completely six weeks every winter, leaving the island cloaked in darkness 24 hours a day.

In Greenland's interior a 700,000-square-mile ice cap covers everything up to a depth of two miles. Though the island is more than three times the size of Texas, only a thin strip along the western and southern coasts is livable, and even there life is rugged. Tiny villages hug inlets that are often packed with icebergs. Nary a road joins the settlements; all travel is by sea or helicopter.

Indeed, life is so strenuous here that the biggest cause of death isn't disease but accidents—one in every four deaths. Vicious, part-wolf sled dogs forage about in most smaller communities, sometimes attacking children and even adults. Sixty seconds is the usual survival time for anyone who falls into the icy sea.

Despite these hazards, life is looking up for Greenlanders (the term Eskimo is rarely heard here). Living as hunters and subsistence ishermen, families were formerly spread all along the coast. Children found it difficult to go to school, medical care was almost nonexistent and, during especially hard winters, some families starved.

Today, however, urbanization is the key element of Danish welfare spending as the government uses the lure of jobs and low-cost housing to draw Greenlanders away from the smaller villages.

In Godthaab, the capital, which has a population of 6,500, ten new eight-story apartment buildings are rising in one subsidized housing project. Each building will contain a seal flensing (skinning) room as well as the customary laundry. In the rooms are enormous concrete tables where seals are laid out to be skinned. Nobody expects them to be used much—sealing is becoming more and more of a lost art except in the far north. But the average Greenlander feels lost without a room that accommodates seal hunters, and the government believes this bow to tradition will ease the transition to apartment living.

Nearby, other Greenlanders are moving into new colorfully painted frame houses with slanting roofs. These homes, too, are government subsidized, and they look as uniformly standard as toy houses in a Monopoly game. Such structures are fast replacing the traditional Greenland igloo, which is made of peat blocks with windows covered with seal bladder membrane.

Danish aid has substantially boosted the number of jobs available on the island. At Disko Bay, north of Godthaab, Greenlanders are harvesting one of the world's largest shrimp beds, an industry subsidized by the Danes. Until a few years ago, Greenlanders fished only to feed themselves and their families. Now the government is fostering the rise of a trawler fishing industry by offering low interest loans to novice fishermen who want to attend vocational school or to buy boats and fishing gear.

Greenlanders say it won't be too long before trawlers and outboard motorboats replace the kayak, a one-man canoe made from sealskin that has long been a traditional fixture of Eskimo life. At Umanak, a fishing town set on a spectacular fjord, fishermen and hunters armed with rifles set out in small boats equipped with 25-horsepower Evinrude outboards. On the shore, kayaks are stored away in racks as if they haven't been used in a long time.

A youngster shakes his head when asked if he has hunted in his kayak lately. "In an outboard I can take my girl friend with me when I hunt," he explains. "I can't do that in my kayak."

Law Problem In Antarctica

WELLINGTON, New Zealand, (REUTERS)—Law and order threatens to become an issue in the most peaceful continent on earth, Antarctica.

No independent states exist on the five million square mile ice covered continent, and all territorial claims have been suspended under the 1959 Antarctic Treaty until 1991.

The treaty leaves the continent free for scientific research—excluding nuclear explosions.

So, Antarctica has, in theory, no law.

However, individual scientific stations maintain their own discipline, and so far all visitors to the frozen south have been well behaved.

But the frequency of tourist parties is increasing, and a civilain construction team is currently working on a substantial permanent building at the large American McMurdo Station.

If any one of these people should commit a crime, what could officials in Antarctica do?

The problem of Antarctic law, or the lack of it, has bothered the commander of the United States Naval support forces in Antarctica, Rear Adm. D. F. Welch, more than anyone else.

As the official "U.S. representative in Antarctica," he is responsible for the safety of the men under his control.

If they commit a misdemeanor, they can be dealt with under military law.

But with the number of nonmilitary men in Antarctica increasing, law and order could become an issue.

Questioned about this, Welch said: "I am legally responsible for the safety of my men, and I would fly an offender out as soon as possible."

If the offender were an American citizen, he would be sent to the nearest U.S. territory—probably Hawaii. But what would happen to him there, no one knows.

"That would be a problem for the lawyers to argue over," said Welch.

New Zealand, which claims a segment of Antarctic territory known as the "Ross Dependency", which includes McMurdo Station, has appointed the leader of its Scott Base as a "justice of the peace", with certain legal functions.

But whether his powers could be upheld by a New Zealand court is uncertain. As a signatory to the Antarctic Treaty, New Zealand has technically suspended its claim to the territory until 1991.

A 10-pound steak sold for $48 a pound in Circle, Alaska, during the gold rush days of the 1890s.

ARMY ENGINEERS SAY THEY CAN BLOCK PIPE

WASHINGTON, March 5 (AP)—The Alaska district of the Army Corps of Engineers has served notice that it could block a proposed oil pipeline across Alaska even if the Interior Department approved it.

The corps' Anchorage office sharply criticized Interior's assessment of potential environmental impact, thus fanning the controversy over the planned 800-mile pipeline that would carry hot oil across frozen ground and earthquake belts.

Interior's impact statement, the corps said, may not even meet the legal requirements of the National Environmental Policy Act of 1969 and "in our opinion is quite vulnerable to challenge."

A spokesman for the Engineers' Corps has said that the proposed pipeline would require not only right-of-way permits from the Interior Department but also permits from the corps to cross navigable streams.

Antarctica Anniversary

By BELMONT FARIES

WASHINGTON, June 20

The 8-cent commemorative for the 10th anniversary of the Antarctic Treaty will be issued here Wednesday with first-day ceremonies at the State Department.

Secretary of State William Rogers, Postmaster General Winton M. Blount and ambassadors of the 11 other nations pledging the area to peaceful uses and scientific cooperation will take part in the 3 p.m. program in the department's John Quincy Adams room.

Most of the 12 treaty signatories are issuing stamps for the anniversary.

The United States stamp, designed by Howard Koslow of East Norwich, N.Y., features the Antarctica map emblem of the treaty organization in white on a blue square.

At least eight of the other 11 treaty nations have announced Antarctic Treaty stamps, and some of the others may issue commemoratives during the year.

ARGENTINA — An $0.25 stamp in a quantity of 2 million is in the 1971 philatelic program, with no details of date or design.

AUSTRALIA — 6c and 30c stamps for Australian Antarctic Territory will go on sale to collectors Wednesday, with first use at the Australian bases at Macquarie Island, Mawson, Davis and Casey in the November-January period as relief ships carrying supplies and the stamps reach the various bases. The designs by John Mason of Melbourne picture sastrugi (6c) and pancake ice (30c), snow and ice forms peculiar to the polar regions. The stamps have been photogravure printed by the Note Printing Branch of the Reserve Bank of Australia.

BELGIUM — A 10F stamp picturing an Antarctic work scene will be issued tomorrow (the advance sale was yesterday). The design by M. O. Bonevalle was printed by photogravure at the Stamp Printing works at Malines in an order of 1.77 million. It shows a scientist with a recording instru-

ment watched by penguins and with a ship in the background.

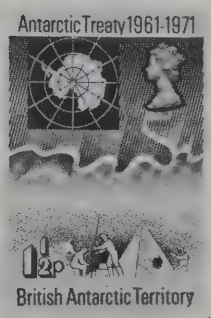
CHILE — No information available.

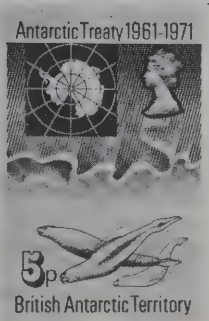
FRANCE — No information available.

GREAT BRITAIN — Four stamps for British Antarctic Territory will be released Wednesday by the Crown Agents. The designs by Michael Goaman all feature the map emblem, the portrait of Queen Elizabeth II and the Aurora Australis in the upper portion, but have varied scenes at the bottom. These are scientists and a tent on the 1½p, sea birds on the 4p, seals on the 5p and penguins on the 10p. The stamps were lithographed by Enschede of the Netherlands.

JAPAN—One commemorative to be issued Wednesday.

NEW ZEALAND — A 6c stamp was issued June 9 in a symbolic design by Miss Eileen Mayo of Christchurch with the map emblem and sweeping lines of green and blue, to give an impression of the constant high winds and



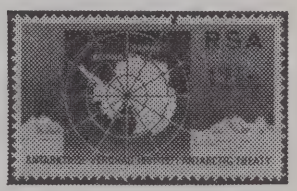


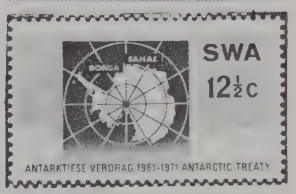
storm-whipped seas in Antarctica. The stamps were printed in photogravure by the Japanese Government Printing Bureau in Tokyo.

NORWAY — A 100-ore stamp to be issued Wednesday features the map emblem and a portrait of Roald Amundsen, the first man to reach the

South Pole. The engraved design by Knut Lokke-Sorensen has been intaglio printed in red and blue by the Norwegian Bank Press of Oslo.

SOUTH AFRICA — A 12½c stamp for the Antarctic Treaty anniversary was issued May 22, the opening day of the RSA 10 international stamp exhibition at Capetown. A sim-





ilar stamp was issued for South-West Africa. The design features the map emblem, with South Africa's bases indicated in red.

SOVIET UNION — No information available.

Treaty Anniversary Creates New Interest In Stamps Of Barren, Frozen Continent

By Mervin L. Chaplin

(Editor's note: This article has been reprinted from "The Linn's Stamp News with permission of the author and the publication.)

The Antarctic Treaty was ratified in 1961. To mark its tenth anniversary, postal administrations of a majority of the 12 signatory powers are issuing commemorative postage stamps.

This action was recommended by representatives of the treaty countries at their fifth consultative meeting in Paris in 1968.

Such stamps have been announced for the U.S., Australian Antarctic Territory, Belgium, British Antarctic Territory, New Zealand, Norway, and Union of South Africa.

The Antarctic Treaty is an important milestone in the history of international relations, and philatelists need to know something about the world's fifth largest continent.

Antarctica lies almost entirely within the Antarctic Circle and occupies 5,100,000 square miles. Unlike the Arctic region, a frozen sea surrounded by land, Antarctica is a frozen land surrounded by oceans.

A huge icecap, estimated to reach an average thickness of two miles, covers the continent. Less than 10 per cent of its area consists of rock outcrops.

Antarctica is distinctive in several different ways. It has no permanent inhabitants. It is earth's highest continent. It is the coldest, and in places windiest, region of the world.

The average altitude—counting the continent itself and its covering of ice and snow — is 14,000 feet, almost five times that of any other continent.

The average annual temperature at the South Pole is 60 degrees below zero Fahrenheit. The Russians at Vostok Station witnessed the world-record low reading of 126.9 degrees below zero Fahrenheit on Aug. 24, 1960. Cape Denison has recorded winds of up to 200 miles per hour.

Scientists consider Antarctica the least valuable of the continents with regard to natural resources. It is virtually a botanical and zoological desert. Only the lowest forms of vegetation grow on its rocks and slopes.

Whales, seals, and Penguins live on the islands and on the outer fringes of the continent, and the most important economic activity of the area is whaling.

The four stamps shown above are representative of an Antarctica topical collection. On the left is an Argentine stamp with a map of its claim (shaded, pie-shaped area). At the top, a dog sled appears on a British Antarctic Territory stamp. At the bottom is a map showing the Australian Antarctic Territory claim. On the right, a stamp from the French Southern and Antarctic Territories sports a pair of penguins.

In 1772-75, a British expedition headed by Capt. James Cook explored the south Polar Seas. The crew circumnavigated Antarctica without sighting land.

The existence of Antarctica as a continent was established by the expedition of Lt. Charles Wilkes of the U.S. Navy in 1830-42.

Several important explorations followed, notably those of Sir James Clark Ross and Ernest Henry Shackleton.

Roald Amundsen, whose likeness will appear on Norway's Antarctic Treaty stamp, was the first man to reach the South Pole. He arrived on Dec. 14, 1911, followed by Robert Scott 35 days later. Scott and his party perished on the return trip, however.

In the late 1920s and early 30s, Rear Admiral Richard E. Byrd explored the continent by air. His activities were noted by release of a U.S. commem in 1933 (Scott No. 733) and souvenir sheet in 1934 (No. 735).

Both were reprinted in 1935 (Nos. 753, 768) as a result of widespread protest against the Post Office's policy of presenting complete sheets of unsevered panes to certain government officials.

Sixty-six nations participated in the International Geophysical Year program (July 1, 1957 — Dec. 31, 1958), and Antarctica became its focal point. Twelve of them set up bases on its coast and offshore islands.

IGY was the largest international scientific undertaking of all time. The intensive study of Antarctica was one of its greatest achievements.

In May of 1958, the U.S. proposed to the 11 other nations in the IGY program that a treaty be formulated to preserve the legal and political status of the continent.

After 15 months of preparatory discussions, representatives of the 12 nations (U.S., Argentina, Australia, Belgium, Chile, France, Great Britain, Japan, New Zealand, Norway, Union of South Africa, and USSR) met in Washington, D.C.

The treaty was signed on Dec. 1, 1959, and it entered into force on June 23, 1961, after ratification by the signatory states.

It dedicated Antarctica "exclusively for peaceful purposes" and prohibited the establishment of military bases. It also promoted international cooperation in research by calling for the free exchange of scientific plans, personnel, and results.

No member nation was required to renounce its claims or previously asserted rights to claims. However, there was to be freedom of operation anywhere on the continent, although no such activities were to form the basis for new or extended claims.

Nuclear explosions and disposal of radioactive wastes in Antarctica were prohibited, although peaceful and scientific use of atomic devices was permitted.

There were elaborate provisions for the exchange of plans, observation, inspection, and settlement of disputes that might arise. The treaty bound its members for 30 years.

Seven nations claim sections of the Antarctic region, and four of them have issued territorial stamps for use by their transient scientific inhabitants.

Argentina set up the first weather station on Laurie Island in 1904. In 1908 the pie-shaped section between 25 and 68 degrees west longitude, toward the South Pole and including the Antarctic Peninsula, was claimed by Argentina and declared a part of its mainland.

Other nations followed suit and divided the continent into similar sections of narrow widths. These claims were based mainly on sporadic explorations, and they adhered (with the exception of Norway) to the "sector" principle proposed by Pascal Poirier in the Canadian Senate on Feb. 20, 1907.

The Poirier plan recognized the claims of any nation bordering the polar regions by extending the meridian of its extreme boundaries to the North or South Pole. The concept has never been tested in a world court.

During the decade following World War II, attitudes toward Antarctica became very nationalistic. Claims of territory were made by Argentina, Australia, Chile, France, Great Britain, New Zealand, and Norway.

Although American explorers have discovered and mapped larger areas of the continent than those of all the other nations combined, the U.S. has never claimed or recognized any other nation's claim to any Antarctic territory. However, it reserves the right to make claims at a future time.

The Russians, until IGY, had not been involved in Antarctic affairs since Von Bellinghausen circumnavigated the continent in 1819-21, but they have taken a stand on Antarctic claims similar to that of the U.S.

Australian Antarctic Territory began issuing stamps in 1957. Its attractive pictorials show explorers Mawson, David, and McKay, map of claimed territory, dog teams, icebergs, penguins, seals, weather instruments, and other items relating to Antarctica.

French Southern and Antarctic Territories is the most prolific stamp-issuing entity in the South Polar area. Its first issue was released in 1955, and about 60 different stamps have appeared to date. Almost all of them are multicolored and finely engraved with various topical designs.

British Antarctic Territory has

issued at least two dozen stamps since 1963. Previous to that time stamps of the Falkland Islands Dependencies were used. Ships and equipment used by scientists dominate the stamps of this British Colony, which includes Graham Land, South Orkney Islands, and South Shetland islands.

New Zealand's Ross Dependency has released only two sets of four each since 1957. They depict Capt. Ross's ship, "Erebus," explorers Shackleton and Scott, map of the dependency, and Queen Elizabeth.

The stamps of Antarctica make a beautiful, relatively inexpensive collection of topicals that relate a lot of interesting history. And the new Antarctic Treaty series provides an ideal opportunity for collectors to "explore" the intriguing frozen continent through stamps.

Set of Four Conservation Stamps First Day June 12

POSTMASTER General Winton M. Blount has made public the designs of the four postage stamps in the Wildlife Conservative Series.

The 8-cent stamps will be issued with first-day ceremonies June 12, 1971, at Avery Island, Louisiana. This bayou area is famed as the locale of Longfellow's poem, "Evangeline" and is a sanctuary for more than 10,000 birds, including the egret, which was thus enabled to escape extinction.

A polar bear, a California condor, an alligator, and a trout appear on the jumbo-sized horizontal stamps, which will be issued in panes of 32. The four subjects appear on the same pane. All but the trout are threatened with extinction, and increased water pollution endangers some of these.

Stanley W. Galli, a California artist, whose forte is picturing wildlife, designed the stamps. Stamp collectors voted his 1968 wood ducks stamp the best design of the year.

The stamps will be printed in three passes through the offset presses and one through the Giori press.

Hans Egede

Denmark on May 27 will commemorate Hans Egede on the occasion of the 20th anniversary of his arrival in Greenland with the above 1 Krone stamp showing his portrait, reports Danish postal officials. The designer was Povl Christensen, engraver, Czeslaw Slania, and printing will be in sheets of 50s on fluorescent paper.

Egede Salute

On May 6 Greenland commemorated the 250th anniversary of the arrival of Hans Egede in Greenland with the above 60 ore issue showing his arrival. The designer was Jens Rosing, engraver Czeslaw Slania, printing in sheets of 50 subjects.

Expedition Anniversary

Tristan de Cunha will commemorate the 50th anniversary of the Shackleton-Rowett Expedition and visit to the nation by adding on June 1 the four stamps pictured above reports the Crown Agents. Values are 1½, 4, 7½, and 12½ pence. The designer was V. Whiteley; printing was lithography on C. A. block watermarked paper in sheets of 25s by John Waddington of Kirkstall Ltd.

. Samuel Hearne was the first European to reach the Coppermine River in July, 1771, with an expedition—its route indicated on the stamp—that was undertaken for the Hudson's Bay Company from Fort Prince of Wales. He too, like Columbus, was directed to find a northwest passage and hopefully, to locate a legendary copper mine said to exist in the area. Two earlier expeditions failed. A third, with an Indian, Matonabee, as its guide, led Hearne to the Arctic coast, although the northwest passage as well as the copper mine were not discovered. The Indians and the wildlife and geography of the far north were recorded in Hearne's journals.

PROTECT THESE CREATURES

This block of four Conservation stamps follows the pattern of earlier issues, in which four wild creatures in need of protection are shown on four different stamps printed se tenant in the one sheet. Featured in this issue is a trout, an alligator, a polar bear and cub, and a condor in flight.

Argentina Honors Polar Expedition

On February 20 the Republic of Argentina issued a single 20c stamp to mark the 1965 expedition to the South Pole. The design shows a member of the expedition planting the flag of Argentina at the pole with a map of the Argentine Antarctic Sector in the background.

On October 26, 1965 ten Argentine army officers under Colonel Jorge Edgard Leal began the loneliest journey in the world which came to a successful conclusion on December 10 when they reached the South Pole.

AIDJEX: *A white tornado of research*

University of Washington

No, AIDJEX is not a cleansing powder.

AIDJEX, Arctic Ice Dynamics Joint Experiment, is an international project co-authored by a University professor and directed from the University campus.

AIDJEX is the largest cooperative arctic research project to date, and, as one professor put it, "AIDJEX has become the center of gravity of a revolving new research policy of the U.S. government."

AIDJEX is also a-$20- to $30-million project which should fold up in 1976, having learned how to predict the motion of the arctic ice pack from weather data.

"Ultimately we would like to have a computer model that allows us to feed in a weather chart and then predict how the ice is going to move, where is is going to pile up and how this affects the atmosphere and ocean," explained Prof. Norbert Untersteiner, who originated the program with Kenneth L. Hunkins (Lamont Research Lab).

Knowledge of how arctic currents, atmosphere and ice pack interact has important applications.

For example, the southern boundary of sea ice in the North Atlantic Ocean has shifted hundreds of miles in historic times, and it appears sea ice cover has important effects on the earth's climate.

In Iceland, advancing ice is playing havoc with fishing.

Ability to predict ice movements would also have obvious use for navigation in the Arctic.

Such navigation will probably be increasing as oil and mineral companies move north.

Fishing in the Arctic may also increase, since recent Russian findings indicate there may be commercially useable schools of fish amidst the ice.

To find out how the arctic ice pack responds to currents and wind, AIDJEX plans a one-year study, probably in 1973. With an ice island as a central base, four manned stations 60 miles apart will be on drifting ice.

An ice island is an iceberg formed on land, and is much deeper than an ice floe, which is ice formed on the ocean.

Beyond the ring of manned stations, there will be another ring of unmanned stations taking measurements by instrument.

A snowbound slum? Not really—this is a pair of the heavily-insulated plywood-and-aluminum buildings used in the Arctic this spring for housing and storage by the University's AIDJEX team.

Researchers on planes will take aerial photographs, measure the surface temperature with an infrared scanner, and search out ridge and fracture systems with side-looking radar.

With the help of an unmanned submarine being developed in the University's Applied Physics Lab, the bottom of the ice will be mapped. The roughness of the ice affects the drag of an ice floe in the ocean.

Data from satellites will also be used

In all, observations of ice thickness, position, profile, acceleration; wind stress, radiation, atmospheric pressure and heat flux; water stress, tilt, and ocean currents will be taken simultaneously.

One of the main obstacles is that the ice itself varies.

Rather than being the same throughout, each hunk of ice has pressure ridges and may break apart, making the mechanical properties of ice difficult to ascertain.

The overall effort is multidisciplinary, involving researchers in oceanography, engineering and atmospheric sciences.

For example, the most recent grant at the University under the AIDJEX program went to Prof. Untersteiner of Atmospheric Sciences, William Criminale of Oceanography and Roger J. Evans of Civil Engineering.

A number of the AIDJEX researches are from the University.

The project is also multi-agency. Funds come from many governmental agencies in the United States and Canada and most of the money goes for transporting and providing an Arctic base for the researchers.

So far only Canada and the United States are involved, but scientists in Japan and Norway have also expressed an interest in the project.

Until 1973 there will be large annual expeditions and several smaller ones to test instruments and develop techniques.

Though the project only came into formal existence last November, the first pilot projects were actually run in 1970.

This spring 50 investigators worked on an ice island, including a 14-member team from the University headed by Dr. Lawrence Coachman and Dr. James D. Smith.

Next spring will provide the last large expedition before the year-long project in 1973, if the work progresses as well as it has so far.

Research on the dynamics and thermodynamics of arctic sea ice will be conducted at the University as a part of the Arctic Ice Dynamics Joint Experiment (AIDJEX) under a one year, $284,800 grant from the National Science Foundation announced yesterday by Rep. Thomas Pelly.

The AIDJEX project is an interdisciplinary program designed to learn more about the physical properties of sea ice as a geophysical phenomenon, the transfer of momentum between the atmosphere and the ice and between the ice and the ocean, and the effects of ice motion and deformation on heat balance.

Dr. Norbert Untersteiner, professor of Atmospheric Sciences, was involved in the development of the original concept and scientific plan for AIDJEX and is principal investigator for the newly awarded research grant.

Betty Anne Morse, oceanographer, and first woman researcher in the Arctic takes a sighting during this spring's expedition. (photo courtesy of AIDJEX)

Research work will be conducted by faculty and staff of the departments of Atmospheric Sciences, Oceanography and Civil Engineering and the Geophysics Program and a special projects office in Tacoma of the U.S. Geological Survey.

A primary goal of the overall AIDJEX program is "ice forecasting" to the same extent that atmospheric pressure is now forecast. This will be attempted, under the new NSF grant, through the development of a predictive model that will yield forecasts of ice deformation and drift on the basis of easily measured quantities.

In addition to providing insight into the mechanics of ice deformation, it will make it possible to estimate, from a given atmospheric pressure field, what the ice conditions in a given location will be. The model will be helpful in predicting changes in climate by providing a better understanding of the relationship of the ice cover of the Arctic Ocean to world climate.

Languages Are No Barrier

YELLOWKNIFE, Northwest Territories (Canadian Press)—While most of Canada struggles with bilingualism, the Northwest Territories held its planning conferences for the 1970 centennial celebrations in four languages—English, French, Eskimo and Indian—says E. A. Ballantyne, director-general for the Centennial.

ERNEST F. JESSEN, EDITOR IN ALASKA

Pioneer Settler Dies at 80 —Began Gold Hunt at 15

FAIRBANKS, Alaska, March 28 (AP)—Ernest F. Jessen, an Alaskan pioneer who came here 65 years ago and stayed to publish one of the state's best-known newspapers, died Friday He was 80 years old.

Mr. Jessen left Seattle in 1905 and made his way by foot and dogsled from Valdez. to Fairbanks, following the lure of gold. He founded Jessen's Weekly in 1942 after 16 years as editor of The Seward Gateway. Before that he failed at mining in Nome and king-crab fishing in Cordova.

His plant and presses were destroyed by fire in 1948, but Mr. Jessen didn't miss an issue.

In November, 1960, he sold the weekly to a group headed by Robert Giersdorf, a former member of the Alaskan Legislature, and announced his retirement. Other business interests prevented Mr. Giersdorf from attending to the publication, and Mr. Jessen resumed as publisher in September, 1961.

The newspaper was wiped out by the 1967 flood. Mr. Jessen sold out. He took over again in November, 1968.

The weekly, with a circulation of 6,000, was delivered by dogsled, bush plane, boat and even on the backs of travelers to Alaska's remote towns and villages.

Mr. Jessen is survived by his widow, Catherine Mary, whom he married in Seattle in 1910, and two daughters.

A funeral service will be held tomorrow.

Holder of Many Jobs

Mr. Jessen was born in Seattle. He ran a delivery service in Fairbanks, worked on Yukon River steamboats, and had a job in the roundhouse of the Copper River and Northwestern Railroad at Cordova, before he was hired as a reporter for The Cordova Daily Times. Later he worked for The Daily Times in Anchorage for six years. He moved to Seward and bought The Seward Gateway.

From 1939 to 1942, Mr. Jessen worked for The Daily News-Miner in Fairbanks before establishing Jessen's Weekly.

Whale Is Becoming 'Performer' Here

April 4

A 19-foot white whale named Alex is beginning to demonstrate how he can extend a flipper and "shake hands" with his trainer at the New York Aquarium at Coney Island.

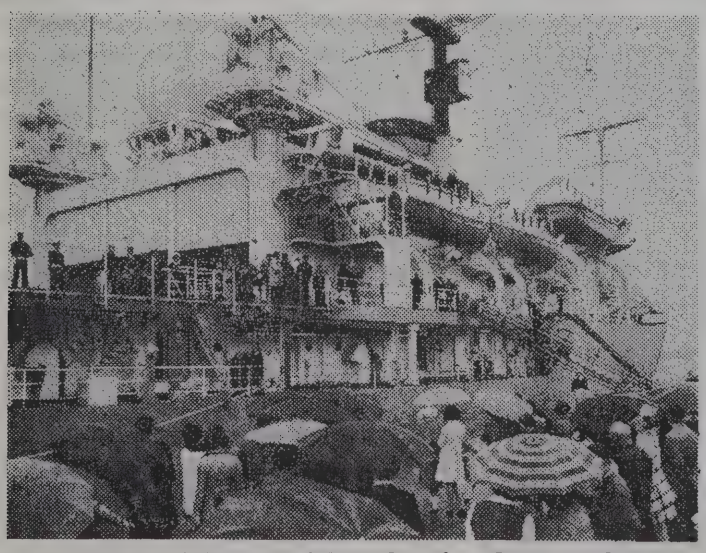
Alex is also becoming adept at retrieving a wooden and rubber bar bell floating in his tank and hurling his three-quarter-ton body completely out of the water to kiss a rubber ball held on a stick.

And if Alex continues to impress, Dr. James A. Oliver, the aquarium's director, intends to permit him to demonstrate his tricks to the public "about the middle of April."

By that time, Alex's trainer, Austin McDevitt, hopes to have Alex schooled to perfection.

"He has great intelligence and curiosity and friendship," said Mr. McDevitt, "and that all helps me in training him. I think he is even more intelligent than dolphins and sea lions."

The New York Times/John Sofo



Back After 5 Months in Antarctic

The icebreaker Fuji returns to Tokyo's Harumi Pier this morning after winding up its five-month voyage to the Japanese observation base in the Antarctica. Because of the cancellation of a call to Colombo due to the unstable political situation there, the observation ship returned home about a week earlier than scheduled. May 4

CROCODILE FOSSILS ARE FOUND IN RUSSIA

MOSCOW (UPI)—The Soviet Union has reported the finding of a cemetery of petrified crocodiles deep in an Arctic coal mine, indicating that the frozen area once abounded in fish, fowl and ferns.

Tass, the official Soviet press agency, said miners near the Arctic town of Inty had discovered the crocodile fossils in a coal seam. Scientists named them "Intahukhus" in honor of the town.

"Scientists believe that once this locality abounded in fern fields and warm lakes populated by fish, amphibians and waterfowl," Tass said. "With time, the climate changed and rivers flowing into lakes brought silt and sand from the Ural mountains.

"Later lakes grew shallow, turned into swamps, then became peat bogs and thick coal deposits, entombing the crocodiles."

Regulation of Snowmobiles Urged in Northwest Canada

YELLOWKNIFE, Northwest Territories, Feb. 13 (AP)—Snowmobiles have replaced dog teams in much of the Arctic area, the Northwest Territories Council said this week, and it called on the territorial government to legislate safety regulations for the new mode of winter transportation.

"At least in the eastern Arctic, I don't believe there's a dog team left," said Bryan Pearson, councilman for the district. He added that accident rates were rising.

The resolution was approved unanimously.

Lessons From The Arctic

THE BLEAK CLIFFS of Banks Island rose abruptly from the sea ice while ahead lay Mercy Bay, the cove where Captain Robert M'Clure sought and found refuge during his expedition to the Northwest Passage in 1851. Like M'Clure's tiny sailing ship, the giant *SS Manhattan* faced dire difficulties.

Unable to back down or move ahead under the 43,000 horsepower thrust of the vessel's engines, project officers on board the experimental icebreaking tanker decided to innovate, to divert all available power to the engine room for a breakout attempt.

Lights flickered out as generators whirred to a halt. The central heating system and all auxiliary machinery closed down. But crucial steam for the turbines increased by three per cent. The Canadian icebreaker *John A. Macdonald* nibbled an open space around the stern of the mammoth vessel as she prepared for a lunge at the ice.

An observer aboard the *Macdonald* described the scene:

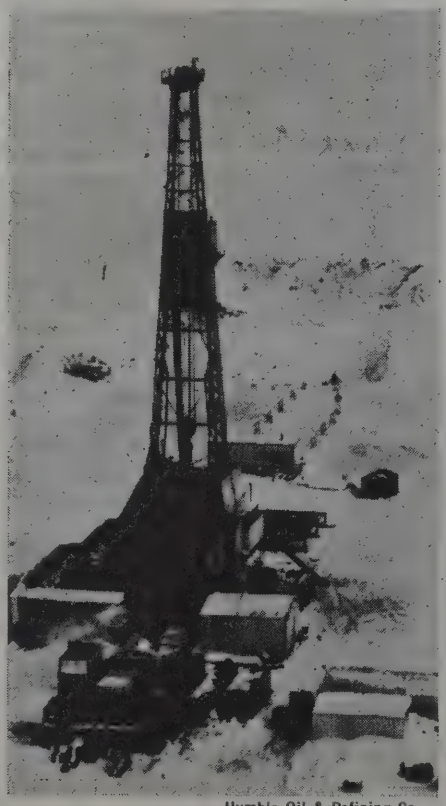
"The *Manhattan* backed off as far as she could and had a go at it with everything opened up wide. It was an astonishing performance for with only that little bit of extra power she was a different ship entirely. The first time she got about three-quarters of a length. She backed off again and the next time she did about two lengths. The third time she just kept going. She went charging through this very heavy ice, ice up to 20 feet thick, and maintained a speed of four knots. These huge masses of ice being thrust aside by the bow, tilted up on edge, pushed down, and shoved away, as this great ship just kept going."

It was an exciting moment, but for the computers only another input of data which ultimately would help decide the feasibility of moving Alaska North Slope crude oil to market in icebreaking tankers.

True, these same computers later concluded that a pipeline could do the job more economically (although shipping proved both practical and economically feasible). But the treasure of knowledge brought back for mankind by the *Manhattan* may far outweigh this decision. In the areas of ice dynamics, navigation, ship design, communications, and hydrography, the *Manhattan* increased man's understanding of this remote part of our planet enormously.

"The voyages brought into focus studies done by a number of people and organizations over many years, spurred a great deal of new research, and have resulted in new concepts of the Arctic," says Walter Whitman, director of polar oceanography for the U.S. Navy. "Probably more information was accumulated by the *Manhattan* than in all previous history in determining the capability of ships to penetrate pack ice in all seasons."

"The *Manhattan* not only broke ice, she dislodged skepticism in the mind of man concerning the Arctic," adds Dr. Andrew Assur, chief scientist for the Army's Cold Regions Research and Engineering Laboratory. "Now everyone is interested and this, ultimately, may be the *Manhattan's* greatest contribution."



Humble Oil & Refining Co.

INCENTIVE: Reaching Prudhoe Bay's oil by ship—"cheapest form of transport."

As never before, Arctic ice has been defined. Scientists better understand what types of ice are where; ice thickness, and salinity; whether it is moving or static; and the size and strength of ridges.

Icetronauts from the *Manhattan* not only provided many answers to these uncertainties, they advanced the techniques for defining ice with airborne remote sensing devices. Using infrared photography and sidelooking radar, they learned to evaluate types of ice with remarkable reliability simply from a flyover. As scientists from the *Manhattan* drilled into the ice, their data were coordinated with that obtained from instruments aboard U.S. Coast Guard and Canadian Ministry of Transport planes.

"Research on the use of remote sensing devices was moving forward on its own impetus, but the timing on several programs was adjusted to coincide with and support the *Manhattan* project," says Captain Fred Goettel. Captain Goettel completed the first voyage aboard the *Manhattan* as representative of the Coast Guard Commandant and liaison officer between the project manager and Coast Guard forces supporting the operation.

How do the remote sensors work? First-year ice contains more salt, reflects more heat, and appears on infrared film as a different color of gray. The salinity leaches out in time, however, making older ice harder and colder. First-year and multiyear ice also produce different images on a radar screen.

"The use of airborne remote sensing devices is not new, but the *Manhattan* was the first ship to use them on an operational basis," points out Bill Markham, officer in charge of Canada's Ice Central, ice forecasting branch of the Ministry of Transport.

Definition of ridges provided another parameter of knowledge. Prior to the *Manhattan*, navigators considered these

broken, jagged piles of ice an extremely formidable barrier to the passage of a ship, perhaps the toughest in the Arctic except bergs. This assumption proved somewhat naive.

"We found that first-year ridges are no problem," says the Navy's Whitman, "and that the old healed types containing ice which has melted in the center and refrozen are extremely tough, tougher than we expected. In the past, we paid less attention to the old ridges because they didn't have the height of the others."

Ice remaining in a ship's track also proved weak. Navigators found they could reduce power requirements 25 to 40 per cent by following a broken channel even though the route had refrozen.

While testing in M'Clure Strait, men of the *Manhattan* refined an onboard radar surveillance technique which may prove extremely valuable for ships navigating in ice. It allows a mariner to predict from the bridge the presence, size, and type of ice floes six miles ahead with 95 per cent accuracy.

For two and a half days the *Manhattan* bulled her way 150 miles northward into M'Clure's rock-hard polar pack. But with radar guidance, Captain Roger Steward retraced his route in only 10 hours. Captain Arthur Smith, who commanded the *Manhattan* on her second voyage, navigated by radar 250 miles through open leads from Bylot Island across Baffin Bay — a remarkable achievement considering that the sea was 90 per cent ice covered.

Their secret: on a three-centimeter radar screen, a soft, first-year ice floe or an area of open water appears square, rectangular, or irregular in shape with arms extending outward. A hard, multi-year floe shows on the screen as a dark circle or ellipse, framed by a thin edge of white (upturned ridges of ice).

The *Manhattan's* navigators also found 10-centimeter radar equally effective in locating larger targets, such as bergs, bergy bits, and ice islands.

As big and strong as the *Manhattan* was, she served only as a research data collection vehicle. Hundreds of strain gauges and monitoring instruments on board provided information for the design of a new generation of icebreakers more efficient than any now afloat.

Heavy ice conditions with floes of up to 15 feet thick presented little challenge to the giant tanker.

Shortly before the *Manhattan* departed for her second voyage, Humble commissioned Newport Shipbuilding and Dry Dock Company to complete a preliminary design for a 1,250-foot-long icebreaking tanker of approximately 300,000 deadweight tons.

One of its most important features is a new icebreaking bow.

"The *Manhattan* bow, a modification of the Coast Guard's 'White bow', was in the right direction but we found that it can be improved," says Bram Mookhoek, Humble's technical director for the *Manhattan* project. "It broke the ice well enough but didn't move it out of the way very efficiently. Up to 25 per cent of our power went to overcome ice drag on the hull."

Other design criteria:

> Increased power. Both voyages confirmed the inadequacy of the *Manhattan's* power plant which provided 43,000 horsepower ahead and 13,000 astern. But designers anticipated this and planned for icebreaker assistance on both voyages.

> A geared steam power plant. The *Manhattan* became the first icebreaker to be powered by this system and its

reliability and efficiency were great question marks during the expedition. Conventional icebreakers operate on diesel electric engines with no danger of stripped gears. But the *Manhattan's* twin props lay so deep in the water (30 feet) that the shaft did not build up dangerous torque levels.

> High-strength steel on all external surfaces of the bow and cargo tanks. Ice knocked two holes in the *Manhattan's* outer hull but high-strength steel protecting critical areas of the ship suffered no damage. Mild-strength steel becomes brittle under the extremely low Arctic temperatures.

> A hull-girdling ice belt of high-strength steel.

> A three-propeller propulsion system.

"Incorporating all the things we learned from the two voyages, we think a ship built from this preliminary design could operate in the Arctic safely and 35 per cent more efficiently than the *Manhattan*," says Mookhoek.

The *Manhattan* maintained 99 per cent communications reliability with Humble's Houston, Texas headquarters during the voyages, proving for the first time that reliable radio contact can be maintained with Arctic regions.

This was quite an achievement, for the Arctic offers the earth's greatest challenge to radio communications. Particles of radiant energy from the sun are pulled to Arctic areas by the magnetic pole, causing severe atmospheric disturbances, "northern lights," and a variety of communications breakdowns. Records from most polar expeditions nervously describe these phenomena.

Only once did a total radio blackout hit the *Manhattan*. The ship's radio officer returned from a coffee break one morning to find all communications dead. "We didn't even have static," he explained. "I thought it was a power failure until I realized all of the panel lights were burning." Using transmitters in Iowa and California, radio operators put a carefully prepared contingency plan into effect and within a short time the *Manhattan* picked up faint signals. The ship returned to full communications capability that afternoon. Government records indicate the phenomenon blacked out the average station in the Arctic for two and a half days.

Adding to the meager pool of scientific knowledge regarding Arctic communications, Humble conducted and documented nearly 5,000 radio tests for the Federal Communications Commission, including 300 scheduled experiments with U.S. and Canadian stations.

Several new communications innovations contributed to the system's effectiveness: computerized predictions of radio wave behavior for different times and conditions; automatically aimed and highly directive radio antennas of a type previously used only on government vessels; extremely stable, automatically tuned and high-powered transmitters capable of changing frequency rapidly; complex techniques for filtering out auroral noise; and the use of multiple, centrally controlled stations on the US mainland.

As the *Manhattan* cruised through Baffin Bay ice near the eastern end of the Passage, NASA scientists ran a series of tests via a communications navigation satellite positioned over the Pacific south of Mexico.

They communicated farther north on the globe than they had previously believed possible with this type of system. This new knowledge strengthens the possibility of a global communications network requiring fewer satellites and the development of an efficient satellite system for communications between the Arctic and the US mainland. It also suggests the possibility of a combination satellite system aiding both navigation and communications.

"There is no question that we can maintain reliable contact with ships navigating through the Arctic," says R. C. Aude, manager of Humble's telecommunications function. "But it will require a system much more complex than those on present commercial vessels. The success of the *Manhattan's* communications system was made possible primarily by developmental authorizations specially provided for these scientific research expeditions."

Additional findings:

> Man can function efficiently in the Arctic. Medical officers found no human limitations for marine transportation through the Northwest Passage.

> Ice in the Northwest Passage is thinner than previously thought. The *Manhattan's* scientists did their measuring over deep water while most data in the past came from near-shore test sites. Cold land masses produce thicker ice.

> Several landmarks showed up out of place on existing charts, and water depth soundings, although accurate, proved too widely scattered for use.

> A warmer water current flows 500 feet beneath the ice for the entire length of the Passage. Although Arctic seas normally remain a constant 28 to 30 degrees, this current ranged from 35 to 45 degrees. At the request of the US Navy's Fleet Numerical Weather Central, scientists ran temperature profiles on the stream three times a day. Some hydrographers believe it is the same current discovered by Arctic Institute researchers off Greenland in 1968.

> While in the Amundsen Gulf, Canadian navigators aboard the *John A. Macdonald* discovered an uncharted underwater peak. Since then, four Canadian hydrographic and oceanography research vessels (including a hovercraft) have located 20 more structures. Igloo-shaped, they rise abruptly from the ocean floor to within 50 feet of the surface.

"Some people believe they are pingoes formed by ice cores pushing upward," says Dr. Fred Roots, coordinator of the Polar Continental Shelf Project, a division of Canada's Department of Energy, Mines, and Resources. "But it seems almost impossible for pingoes to form offshore. We don't know what they are but hope to put a drill bit into one to find out."

At the request of the US Department of the Interior and Canada's Department of Indian Affairs and Northern Development, scientists on the *Manhattan* conducted a polar bear census. They observed 19 bears on the first voyage, 13 on the second. Their data may help wildlife specialists develop more effective regulations to help save the animals from extinction. Observers also noted concentrations of king eider ducks (which landed exhausted on the deck and promptly fell asleep), beluga whale, caribou, and musk ox.

The voyages of the *Manhattan* could have profound implications for the Arctic, for they proved for the first time that year-round shipping through the Northwest Passage is practical. Indications are that this discovery already has

wrought changes in man's concepts of the area and its resources.

New studies now underway will estimate the cost of mining two known ore bodies in Canada 450 miles north of the Arctic Circle. One company is taking a new look at the big high-grade Mary River iron ore reserves on Baffin Island and another has applied for a license to export lead and zinc from nearby Strathcona Sound.

In the spring of 1970, the *Manhattan* and the Canadian icebreaker *Louis S. St. Laurent* pushed their way through Pond Inlet to within 75 miles of Baffin Island's Milne Inlet, which could be linked to Mary River by railway.

"That showed that we could ship 12 months a year with a vessel designed for it, an ideal ship," says Gavin W. H. Relly, president and chairman of the company which holds a dominant interest in the Baffinland iron mines.

A Canadian government - industry consortium formed to explore for oil and gas has increased interest in the Arctic islands with its findings. Formed at the end of 1967 as a $20 million exploration venture, the company has three rigs operating in the Arctic and is drilling a location on Amund Ringnes Island — at a latitude of 78.19 degrees north. This well is farther north than any ever drilled (the previous records being a 1970 well on Ellef Ringnes at 78 degrees north and a 1956 Spitzbergen test at 77 degrees). Surveys are already underway on Axel Heiberg and Ellesmere Islands even farther north.

The initial test drilled three years ago on Melville Island reportedly encountered four hydrocarbon zones.

Another company is drilling two wells in the Arctic Islands — one on Melville Island and a second on Bathurst, northwest of Resolute.

Paralleling this exploration activity the Canadian government and several companies are studying transportation alternatives for moving Arctic oil and gas to market. The government has launched a $500,000 feasibility study of a tanker terminal on the Arctic Coast. Some engineers point to Herschel Island some 50 miles east of the Alaska border as a likely location. Long used as a haven for whaling ships sailing these waters, it affords a natural shelter from Arctic ice.

World trade patterns also could be altered with a new shipping route.

"The implications for a new trade route through the Arctic are tremendous," says Dr. Assur of the Cold Regions Research and Engineering Laboratory. "Some day some nation may build a ship that will go through. More than likely it will operate north of the Canadian Artcic islands rather than through the Northwest Passage. Within our lifetime this might happen."

Although the voyages of the *Manhattan* have contributed a vast reservoir of knowledge about one of the most remote and least understood areas of the world, much research still remains.

An Arctic marine ecological base line needs to be established. Considerable research has been conducted by land-based ecologists but comparable studies of Arctic sea life are lacking. And the potential impact of human and industrial activity in the Arctic must be carefully evaluated. Already the Canadian government has proposed regulations for ships operating in the Arctic waters.

A better understanding of ice dynamics to provide short-range and long-range ice prediction capability in given Arctic areas and along given routes needs to be developed. Studies continue in this area by both the Canadian and US Governments as well as by private organizations.

AIDJEX (Arctic Ice Dynamics Joint Experiment) launched a pilot research program in the Beaufort Sea in 1970, and plans further tests in the Arctic Ocean to determine stress patterns and interrelationships of ice floes.

In recognition of increasing ship traffic in Arctic waters, the Canadian Ministry of Transport and the US Coast Guard have stepped up their research programs in recent years. In 1969, the *SS Staten Island* conducted ice dynamics studies in the Beaufort Sea, as did the *SS Northwind* in 1970. In the spring of 1971, America's most powerful icebreaker, the *SS Glacier*, will conduct "trafficability" studies north of the Bering Strait.

"Even though Humble has decided not to use tankers for moving North Slope crude oil, the voyages of the *Manhattan* have shown that the use of sea transportation for the development of resources in the Arctic may be just around the corner rather than a vague dream for the future," says Canada's Captain Tom Pullen, Royal Canadian Navy, retired, and present Arctic consultant.

After 473 years of brave voyages through Arctic ice, the mysterious top of our world doesn't seem so mysterious any more. The major steps have been taken to conquer the Northwest Passage, hopefully for the immense benefit of all mankind. **JOE TUCKER**

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Houston, Texas 77001.

The Arctic pack ice that stopped the MANHATTAN

ICEBREAKER, foreground, crunches to *Manhattan's* aid

Morton, in Alaska, Studies Land Claims and Pipeline

The New York Times

ANCHORAGE, June 26—Secretary of the Interior Rogers C. B. Morton crisscrossed 3,000 miles of this vast state last week to assess the proposed trans-Alaska pipeline route and Alaska natives' land claims, his department's two main concerns here.

Mr. Morton touched base at both ends of the 786-mile pipeline route, talked with leaders of the Alaska Federation of Natives and shook hundreds of hands at Republican gatherings.

He also announced that he would indefinitely extend the freeze on disposition of Federal lands here, which total nearly 300 million of the state's 350 million acres, until the Alaskan natives' claims are settled by Congress.

Despite all these concerns, the Secretary managed to make a short fishing trip and to get aerial views of the Mount McKinley National Park, the Arctic National Wildlife Refuge and the Katmai National Monument.

Mr. Morton was making his first visit since succeeding a former Alaska Governor, Walter J. Hickel, as Secretary of the Interior. He would be responsible for issuing a construction permit for the $2-billion-plus pipeline and he serves as Federal trustee for the state's 55,000 Eskimos, Indians and Aleuts.

He is chief spokesman for the Nixon Administration's proposal to terminate aboriginal land claims in exchange for a 40-million-acre, $500-million settlement.

The former Republican National Chairman was careful neither to coddle nor alienate his varied constituents here. Two days after touring the North Slope oilfields with petroleum executives, he said that the Alyeska Pipeline Service Company, the seven-company consortium responsible for the proposed pipeline from Prudhoe Bay to Valdez, was to blame for the delay on granting a permit for the facility.

He said, "The monkey is on the oil companies' back, not mine," and added that he had been "two-weeked to death" with unfulfilled promises by Alyeska for final project design specifications.

The Interior Department must complete a final environmental impact statement, required by the Environmental Policy Act of 1969, before it can issue a pipeline permit.

After Alyeska said that the Interior Department would receive the final data by July 2, Mr. Morton predicted that mid-September would be the earliest date by which he could issue the pipeline permit.

In Barrow, the world's largest Eskimo village, Mr. Morton told a joint meeting of the Alaska Federation of Natives and the Arctic Slope Native Association that he might reluctantly issue a pipeline permit without a Congressional settlement of land claims.

The federation, which seeks a settlement of 60 million acres, $500-million and a 2 per cent royalty on oil revenue in perpetuity, believes that the pipeline is its best bargaining point for a generous bill on land claims.

A State Senator who is a federation board member, Willie Hensley, Democrat of Kotzebue, advised Mr. Morton, "We feel that, once the pipeline permit is issued, in many eyes in Congress the land claims issue itself will be shunted aside. It is the oil that is desired by the country."

Joseph Upicksoun, president of the native association, which represents 4,500 Eskimos who claim North Slope land, says his group will proceed with a lawsuit against the pipeline if the land claims are not settled first.

Mr. Morton said, "I'm hopeful we will not have to issue a pipeline permit prior to the Alaskan settlement of land claims, but I'm going to regard the two issues separately only to the extent that the legal question is involved."

"But, if I feel that it is in the national security interest to do so, then I will issue the permit, and if I have the legal advice that would make it appropriate and proper to do so, then I would issue the permit, he went on.

In Cordova on Prince William Sound, near the proposed pipeline terminus and tanker port at Valdez, Mr. Morton told members of the Cordova District Fisheries Union that their suit against the operation to transfer two million barrels of oil daily might be the wrong approach.

"I don't think the politics are with you," he said. "What we've got to do is try to put all our energy in an effort to make the operation safe and compatible with your industry."

In Anchorage, the Secretary told a civic luncheon attended by 600 people, "It seems perfectly compatible to me that here, in this great land, known for its beauty, vastness and tenderness, should be the place where man decides to put the biggest proposition that he's ever put at one time on the crust of the earth—namely, a 48-inch pipeline across this state."

OIL DRUMS LITTER COAST IN ALASKA

Barrels Used for Garbage Pose Health Problems

ANCHORAGE, Jan. 2 (UPI)—In Alaska the main litter problem is not empty beer cans but discarded oil drums.

At Barrow, on the Arctic coast, about 48,000 of the metal barrels are scattered about the tundra.

In the winter, these barrels are frozen into the soil or ponds and covered with snow. In the summer, the tundra thaws to a soggy consistency that makes it impractical to use vehicles to remove the barrels.

The Eskimos at Point Barrow found a very practical use for some of the empty drums: disposal of sewage and garbage.

The first barrels came to the Arctic several decades ago, when oil explorations were being made on a naval petroleum reserve. About 180,000 barrels were brought in then.

The litter grew during construction of the Distant Early Warning System, when more barrels as well as other equipment and material were left behind.

Of the estimated 48,000 drums still in the area, thousands were scattered by a storm that lashed the Point Barrow region several years ago.

Native leaders, as well as state and Federal officials, agree that the oil drums be gotten rid of because they pose a health problem. Lately, the drums have been deposited in South Salt Lagoon, just north of Barrow, and covered with sand dug from Middle Salt Lagoon.

"Sooner or later," said Eugene P. Bowler, assistant director of naval petroleum and oil shale reserves, "these drums will fill and clog the lagoon. When they rust and disintegrate, a long-term health hazard may develop."

Because Barrow is on a flat coastal plain, lakes used for fresh water supplies in the area also could be contaminated by any waste disposal dump convenient to the village.

Officials say that it would cost $1,174,148 to clean up the oil drum mess. They also figure about $120,000 could be recovered if the drums and pieces of abandoned equipment can be shipped to Puget Sound for sale as scrap metal.

Of course, drums that have been used for sewage disposal would have to be emptied before they could be crushed and baled for shipping.

Recently a program was outlined calling for a clean-up program in 1972. By using helicopters, it is hoped the barrels could be airlifted to a staging area to be crushed and made ready for shipment.

U.S. Oil and Gas Reserves Aided by Alaskan Supplies

WASHINGTON, March 30 (UPI)—The oil and natural gas industries reported today that the nation's total "proved" petroleum reserves would have declined again last year if estimates of new supplies on Alaska's North Slope had not been included for the first time.

The American Gas Association and the American Petroleum Institute said proved reserves—those considered reasonably certain to be recovered from known reservoirs—were 39 billion barrels for crude oil and 290,700 billion cubic feet for natural gas on Dec. 31, 1970.

The Petroleum Institute said the oil figure represented a 9.4-billion-barrel increase resulting entirely from the inclusion of Alaskan reserves. The Gas Association said the addition of 26,000 billion cubic feet in gas reserves at the Prudhoe Bay Reservoir in Alaska offset a decline of 10,300 billion cubic feet in the contiguous 48 states.

'Freeze' on Land in Alaska Is Extended by Morton

WASHINGTON, June 21 (AP) — Secretary of Interior Rogers C. B. Morton announced today a new extension of the "freeze" imposed for the last two and a half years on Federal lands in Alaska.

The "freeze" has blocked selection by the state of more than 100 million acres granted in its 1958 statehood act and has suspended action on applications for mineral leases and other land uses.

The purpose of Mr. Morton's action is to allow time for Congress to legislate a settlement of claims by Alaskan Indians, Eskimos and Aleuts.

Aleutian Isle Prepares for a Nuclear Blast

The New York Times

AMCHITKA, Alaska, June 12 —Atomic Energy Commission contractors are busy preparing this remote Aleutian island for Cannikin, a five-megathon underground thermonuclear blast scheduled for October.

Cannikin wil be the third nuclear blast on this bleak treeless, 42-mile-long island in the Aleutian Islands National Wildlife Refuge.

Two species on the endangered list, peregrine falcons and eagles, inhabit the island's coasts on the Bering Sea and the Pacific Ocean, as do more than 90 other secies of birds, sea otters, seals and sea lions.

On Oct. 29, 1965, the Department of Defense fired an 80-kiloton blast caleld Long Shot; on Oct. 2, 1969, the commission blasted Milrow, a 1.2-megaton test structured to deteermine whether Amchitka was suitable for tests of larger bombs.

Thus far, Long Shot appears to have leaked radiation into just three landlocked ponds, and Milrow apparently has leaked neither on the surface nor into the ocean.

When Cannikin is detonated, it will generate three million degrees Fahrenheit and a blast effect measuring 7 on the Richter scale, which is used to indicate earthquake severity.

The bomb, reportedly a test of the basic Spartan missile warhead, will contain nearly a pound of plutonium, according to Martin Biles, director of the commission's Radiological Safety Division.

Mr. Biles said that plutonium was probably the most dangerous potential source of radiation in the bomb. He discounted the danger from tritium, a radioactive hydrogen isotope ith a half-life of 12.3 years that has been found in trace amounts in three ponds near Long Shot. Half-life is the length of time it takes for half the radiation atoms in a substance to decay.

Some Alaskans worry that tritium could contaminate offshore salmon fisheries if it should leak into the ground water in the area of Cannikin's blast chamber, 3,000 to 6,000 feet underground.

Mr. Biles said tritium, which has a half-life of two weeks in the human body, is relatively easy to contain, but plutonium can enter the lungs and cause permanent damage.

A statement by the commission concerning the blast's impact, discounts as merely a "remote possibility" the likelihood of tritiated water is reaching the ocean before its half-life expires. The commission says that in any case ocean water would so dilute radiated water that it would be undetectable above the existing natural levels.

Dr. Melvin L. Merritt, a Sandia Laboratories environmental effects scientist who is employed by the commission, said that any plutonium gas generated during the blast would be absorbed by rock surfaces before it ever reached the atmosphere. He also said that it was highly unlikely that significant amounts of tritium or other radioactive materials could reach the oceans or the atmosphere in significant amounts.

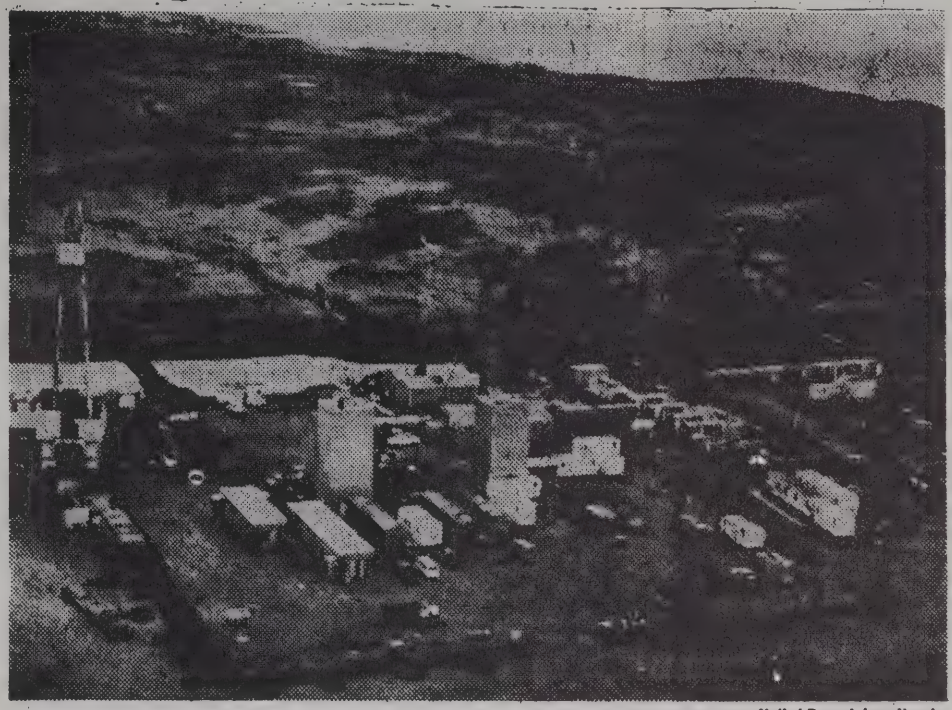
The specter of Baneberry, a blast 150th the size of Cannikin that leaked radiation from the Nevada test site over 13 Western states, haunts the commission. Baneberry, fired Dec. 18, 1970, went awry due to an unexpectedly high concentration of water in the rock at the test site.

Dr. Merritt said the concentration of water in the Baneberry site rock was 30 per cent, while the basalt surrounding the Cannikin blast chamber is only 14 per cent saturated.

Still, the A.E.C. contractors have had their problems while mining a 6,000-foot shaft and a 26-foot-radius chamber. They have used three kinds of pumps to keep the hole dry, and stopped work for days several months ago, when two pumps broke and the shaft partly filled with water.

The commission's site manager, Glenn Stafford, said that "presently we're getting about 20 to 22 gallons per minute and with two pumps working, the hole is essentially dry."

"We've sealed and cemented all the interstitial fractures and the rock we're mining is dry. Everything's going as scheduled; we should finish the chamber in four of five weeks," he said.



United Press International

Nuclear device will be detonated 6,000 feet below these buildings in Amchitka, Alaska

The New York Times June 13, 1971

Arctic Maneuver Planned

ANCHORAGE, Feb. 14 (AP) —About 140 Alaska servicemen will parachute onto polar ice early next month in a training mission to prepare them for Arctic search-and-rescue and first-aid operations.

Assurances Given On Island A-Test

WASHINGTON, June 24 — The Atomic Energy Commission has repeated its assurances that its planned underground nuclear blast on Amchitka Island will not cause earthquakes, tidal waves or radioactive releases.

After about one year of comment and review on its draft environmental statement, the AEC issued a final statement yesterday repeating that Project Cannikin would cause only minor harm to the environment.

Conservationists and others, including Sen. Hubert H. Humphrey, D-Minn., have expresseed fears that the less than five-megaton blast this autumn might trigger an even more powerful earthquake, send a tidal wave rippling across the Pacific Ocean or release radioactivity into the air or water.

Soviets Eye Arctic Oil

Moscow, June 14 (UPI) — N. A. Yeremenko, a Soviet geologist, reported today that Soviet prospecting teams are searching the Bering Sea opposite Alaska for new oil fields beneath the ocean. United States plans for developing the area's oil reserves have encountered opposition from conservationists who fear the northern Alaska wilderness will be spoiled by pipelines.

NAVY AIDE GUILTY IN ARCTIC SLAYING

Shooting on Ice Island Called Involuntary Manslaughter

ALEXANDRIA, Va., May 10 (UPI)—Mario J. Escamilla was convicted today of involuntary manslaughter in the shooting death of his superior on an isolated floating ice island in the Arctic Ocean.

Escamilla, of Santa Barbara, Calif., testified during his trial in Federal court that he had accidentally shot Bennie Lightsy, of Louisville, Ky., manager of a 19-man weather research station called Fletcher's Ice Island, last July 16.

The verdict was reached by the jury on Saturday, but was sealed and was not announced until today.

Escamilla was charged with second degree murder.

He could receive a maximum sentence of three years in prison for the involuntary manslaughter conviction.

Both Mr. Lightsy and Escamilla were civilian employes of the Navy weather station.

Escamilla testified that the shooting was the climax of a series of arguments over whether an Eskimo helper should get some raison wine being stored in Escamilla's trailer.

He said he had chased the Eskimo from the trailer with a rifle that was defective and had been known to discharge without pulling the trigger.

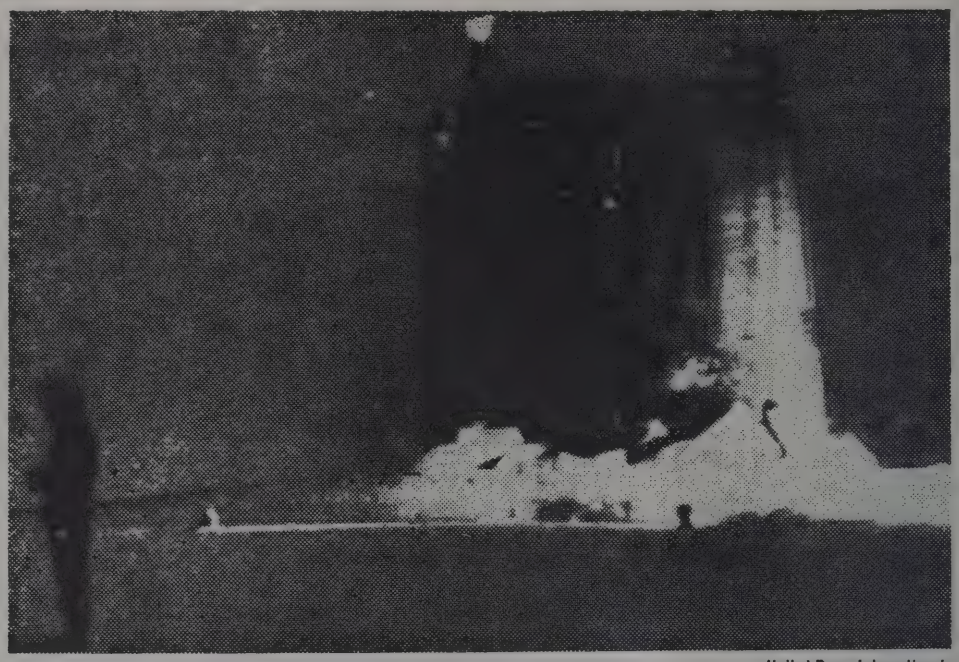
Mr. Lightsy entered the trailer immediately afterward, he said, and began arguing that the Eskimo should be given some of the wine. That is when the accidental shooting occurred, Escamilla said.

"I wanted him to be scared away," Escamilla said. "I didn't mean to do him any harm with the weapon."

Escamilla said he had not touched the trigger, and had not realized the rifle had fired until he saw Mr. Lightsy fall.

He said that he had had the right to protect himself because he had been told the Eskimo was drunk. He said that the Eskimo had attacked him with two butcher knives a few weeks earlier and he had had to protect himself with a chair.

Escamilla was tried in Alexandria because under the law his trial had to be held where he first landed after leaving the island, which for legal purposes was regarded as a ship at sea.



United Press International

BRITONS AT THE NORTH POLE: The Royal Navy's nuclear-powered submarine Dreadnought as she surfaced during a recent visit. The men aboard got out, stretched their legs and built igloos. Temperature: 35 below zero. Vessel returned to Scotland

Battered Sub Completes Trip

GLASGOW, March 12 (UPI)—The British nuclear submarine Dreadnought returned today from a voyage of 1,500 miles under ice to the North Pole and back, bow dented and glassfibre ripped from a fin.

"We went at the worst time of year, from the point of view of ice, temperature and daylight," Cmdr. Alan Kennedy, 36, the captain, said as the nuflear warship arrived at Faslane Base on the Gareloch.

"The Dreadnought traveled 5,200 miles on the polar cruise in 19 days, passing unde the edge of the Artic pack early Feb. 28 naval officials said.

Quake Reported North of Iceland

Reuter

A strong earth tremor in the area of the Norwegian island of Jan Mayen, about 400 miles north of Iceland, was recorded here March 24 by the National Earthquake Center.

The tremor, which measured 6.2 on the Richter scale, was strong enough to cause damage to populated areas, the center added. No reports of damage or casualties have yet been received from the area.

Canadians Devise A Satellite System To Spot Minerals

EDMONTON, Alberta (Canadian Press)—In the pioneer days of mining exploration many a potential gold or silver mine was lost because the unlucky prospector was unable to find his way back to the site of his discovery.

Modern industry developed better ways of pinpointing mineral finds, but, as the search moved northwards, they faced tougher terrain. Offshore drilling also called for new methods of surveying.

The solution, says Shell Canada, Ltd., is a system it has helped to develop that uses satellites to designate latitude, longitude and elevation in a remote or offshore area.

A Shell spokesman said that his company had introduced the concept to Canada and that experimental work from the Edmonton office led to a breakthrough. The satellite system of surveying was developed in the United States and Canadian companies had to rely on the United States Government for information on the position of a satellite.

The satellite used for surveying was sent into a polar orbit 600 miles above the earth at a speed of 16,500 miles an hour by the United States Navy. A radio transmitter in the satellite made it possible to fix the position of a receiver on land or sea.

In 1967, the Navy decided to make these benefits available to industry, but Canadian companies had to get the satellite's positioning from the United States Government.

To bypass the United States Government, a joint program was established involving Shell, the University of New Brunswick and the Bedford Oceanographic Institute in Halifax.

They set up a network of satellite receivers on the East Coast of Canada and one on a ship off Nova Scotia and another on a drilling rig in the same area.

They worked simultaneously to chart the position of the satellite and from that information the latitude, longitude and elevation of a receiver at sea could be fixed.

Pupil's Father Calls Alaska To Learn Eskimo's Hello

WESTFIELD, Mass. (AP)—Bruce Gage, a fifth-grader, was given a homework assignment to find out how to say hello in Hawaiian and in Eskimo.

Hawaiian was easy: "aloha."

But the Eskimo translation was another matter. Bruce spent five hours at the library, to no avail.

Finally Bruce's father placed a long-distance call to the city manager of Nome, Alaska, who said the proper Eskimo word added, most Eskimos have become Americanized and simply use "hello."

The Moose Gooser: Tiny Alaska Railroad Battles the Elements

* * *

Line Run by Uncle Sam Makes Money Despite Wild Animals, Rugged Terrain, Heavy Snows

By JAMES E. BYLIN
THE WALL STREET JOURNAL

ANCHORAGE, Alaska—Is this any way to run a railroad?

Operate your trains at a snail's pace average of 30 miles an hour.

Drop off or pick up passengers anywhere they want, even between stations.

Don't accept reservations. If too many people show up, merely hitch up another car.

That's the way Uncle Sam runs his only railroad, and it's just fine with Alaskans. With 537 miles of track and 2,200 locomotives and cars, the Federally owned Alaska Railroad is a key transportation link in this spacious, sparsely settled state. And thanks to its freight hauls, the Alaska Railroad generally makes money, too—$212,000 last year on revenue of $18.9 million. Of course, the fact the railroad pays no taxes helps.

The Federal Government got into the railroad business here after a dozen private railroad schemes either never moved beyond the planning stages or went broke. Gold strikes in Nome and Fairbanks sparked the interest for a line connecting the warm water port of Seward in southwestern Alaska with the interior and Fairbanks. Originally proposed by President Taft and authorized by Congress in 1914, the railroad was completed nine years and $60 million later.

The construction also gave birth to a tiny railroad camp in the wilderness called Anchorage, now Alaska's biggest city with 45,000 people.

A Service to Passengers

Since the railroad is about the only access to the back country for hunters, fishermen, natives, homesteaders and others, the long standing policy has been to stop wherever a passenger wants. "We have to provide the service," explains John Manley, the railroad's general manager. "We can't put someone off and tell him to walk 10 miles up the track." This policy contributes to the railroad's slowness. Along the 363-mile run between Anchorage and Fairbanks, the train may make as many as 40 or more stops, and take up to 12 hours to complete the trip.

Most passengers couldn't care less because the railroad wiggles through some of the most spectacular scenery in North America. Panoramas of glaciers, snowy mountain ranges, wooded valleys, wildlife and crashing rivers continually unfold along the route. Though jets make the same journey in only 40 minutes tourist-packed trains travel each way between Anchorage and Fairbanks, sometimes stopping just to allow passengers to snap pictures. The road last year hauled 80,000 passengers, compared with 66,300 in 1968.

The passenger train is known hereabouts as the moose gooser—for good reason. Moose have long posed a major problem. Winter snows drive the huge 1,400-pound beasts out of the high mountains and down to the hard-packed railroad track area where travel is easier. Despite precautions, trains have killed as many as 500 moose a year.

Moose Meets Train

"They're funny creatures," says Jerry Allen, a long-time conductor. Often, he explains, a moose grazing in a field will spot a train and, rather than shy away, he'll take off to cross the tracks before the train. "If you miss him, you miss him by inches," Mr. Allen observes.

Ten years ago, a moose stepped from behind a freight shed and onto the tracks in front of a passenger train. The moose was tossed against a switch which, in turn, was thrown. Two locomotives, two baggage cars and several passenger coaches were derailed.

On another occasion, a moose was spotted on the tracks, and the train slowed to keep from hitting him. The moose, however, refused to jump off and continued to run ahead of the train. Finally, exhausted, he merely lay down across the rails. When attempts to pull him off failed, a crew member convinced the animal to leave by applying the hot end of a lighted railroad flare.

Edwin M. Fitch, a railroad official who has prepared an Alaska Railroad history, recalls that the incident resulted in "a wave of criticism of the train crew for its lack of humanity in scorching the moose. There was no praise for the crew's ingenuity in saving the life of a moose."

If a moose is killed, a special crew dresses the meat for distribution to orphanages and other charitable institutions. In past years up to 60,000 pounds of moose have been passed out this way. But fewer moose are being killed these days—only five in the past year. Mr. Manley, the general manager, suspects that the children in the orphanages are mighty happy about the turn of events. "I think some of them got awfully sick of moose," he says.

The major reason for the sharp decline in moose deaths is a new highway now being built between Anchorage and Fairbanks, close by the railroad.

The moose prefer the wider highway bed for their winter trail.

Other hazards include snowmobiles—trains have almost run over drivers who scoot down the tracks—and washouts. One six-mile stretch near Mt. McKinley National Park is perched precariously on the side of a cliff. At times, it must be shored up daily. Between the weight of the trains above and the Nenana River below, which is cutting into the slope, the tracks may settle a foot or more a day.

For $21.35 (compared with $36.75 for a jet flight), passengers ride between Anchorage and Fairbanks in comfortable if not luxurious coaches. The 60-seat air conditioned coaches are refurbished ex-hospital cars that were purchased from the Department of Defense after World War II. They feature wide picture windows that facilitate scenery watching.

Unlike the vending service now being offered by many railroads in the "lower 48," the Alaska Railroad serves up home cooking in its combination dining-club car that many Alaskans rate with the best food in the state.

By high-cost Alaskan standards, the food is reasonably priced and the portions substantial. Among the choices: bacon, eggs, potatoes, toast and coffee, $2.25; sourdough pancakes, $1.25; home-made chili, $1.25; oyster stew, top sirloin with salad, potatoes, vegetable and roll, $4.75.

Uncle Sam even provides free reading material for passengers, including Playboy, Crime Detective magazine, True Frontier and assorted comic books.

The club car is furnished with plastic-covered furniture and, befitting its World War II status, resembles somewhat a hospital waiting room with a view. Cocktails are dispensed at $1.25 a drink, while beer sells for 75 cents a bottle. Entertainment is provided by a juke box that runs heavily to country-and-western music.

Further, the clientele appears more varied than the usual train riders.

Counted among the passengers on a recent trip were a bearded French trapper who tried to continue an all-night party in the club car but wound up sleeping on the floor by his seat, his boots jutting into the aisle; a long-time Alaska resident taking his first trip and gleefully proclaiming he had just seen his first brown bear, and an elderly woman sneaking nips from a liquor bottle in her big purse.

In the early days, only 5,400 people lived along the line. The railroad operated deep in the red, requiring Congressional handouts to stay in business. In 1938, for the first time, the railroad turned a profit and Federal appropriations to meet operating deficits ceased. With one important exception, Congress, in 1956, stopped appropriations for capital projects, which are now financed from operations. The exception: $27 million in 1964 when the Good Friday earthquake ripped up the railroad's tracks and destroyed rolling stock and terminal facilities.

In February, President Nixon proposed selling the railroad. Enabling legislation is now pending in Congress, but Mr. Manley doubts that Congress will act this year. If the sale is authorized, the logical purchaser, he believes, would be the state. A private purchaser would expect at least a 6% return on his investment, and to attain that would require a 30% to 35% increase in freight rates, he says.

ALASKA U. ADDING NATIVE STUDIES

Courses Planned on Eskimo, Indian and Aleut Culture

The New York Times

COLLEGE, Alaska, April 24—The University of Alaska has announced that three and possibly four courses on the state's native culture will be added to the curriculum in September.

Eskimo and Indian student leaders at the university had been seeking such courses since last fall. The courses approved recently by the academic council are in Aleut, Eskimo and Indian literature; in the political science of Alaska natives, and in the art of skin sewing.

Still being considered is a history course that would deal with the heritage of the state's natives.

The Eskimo and Indian student leaders hope the courses will mark the first step toward establishment of a full department of native studies at the university.

Mrs. Martha Jack, an Eskimo from Bethel who heads a student advisory board of Indians and Eskimos, said the native students had "worked constructively with the university administration and faculty" in developing the courses.

The native students, she said, pursued a course of "not backing down but being respectful." In developing the course, "all of us learned a lot about the university administration—this was an education in itself," said Mrs. Jack, a sociology major and the wife of an electronics technology student.

Helen Atkinson, an Indian who graduated from the university last year and is now a counselor in its student orientation program, explained that the new courses would be far different from the university's present offerings in Alaska's past.

More than 300 native students, half of them freshmen, are expected to be enrolled.

The Alaskan Pipeline Is Essential

By WALTER J. HICKEL

ANCHORAGE—I cherish Alaska's beauty. I call it Alaska's "resource of the heart and soul." I would not give the pipeline project my support if I were not convinced—by facts rather than emotion—that it can be built without harming this beauty. The key lies with the Government, and its determination to meet its responsibilities to John Q. Citizen.

Most Americans, whether "developers," "preservationists," or "conservationists"—where I place myself—agree that the United States needs more petroleum if we are to continue to feed, fuel, move and light our nation.

The statistics tell the story: present-known domestic reserves of oil and gas are 40 billion barrels. Daily consumption of these products amounts to some 14 million barrels a day, of which roughly four million barrels come from nondomestic sources, primarily the Middle East.

As individuals we are free, within some practical limits, to curtail our consumption of these resources. But we cannot turn off the ignition of America without plunging ourselves into economic, political and industrial darkness.

We need Alaska's North Slope oil. But we also need, perhaps now more than at any previous point in our history, to respect the environment, and to realize that environmental considerations are needed: Rape of our resources is generally an irreversible process.

If nature had to put that oil somewhere, I'm glad it was on the North Slope of Alaska and not in the Tetons, or the Sierras, or Cape Cod. America enjoys a cherished and immeasurable wealth of frontier grandeur and environmental bounty in its 49th State. And within Alaska's vast reaches, I believe we have room to set aside just 15 square miles, out of Alaska's 586,000 square miles, to be taken up by the entire right-of-way for an 800-mile pipeline from Prudhoe Bay to a deep-water port on the Gulf of Alaska.

The insistence of Americans that the pipeline's integrity be guaranteed in advance is just and proper, and gratifying to those who demand wise use of our resources—without abuse.

Soon after I became Secretary of the Interior, the question of moving oil from Prudhoe Bay to an ice-free port came before me. There were pressures: pressure from those who said nothing should happen, and from those who demanded that it happen immediately. But pressure comes with responsibility, and responsible action could come only after all interests were considered for the benefit of 200 million Americans.

God gave to America an abundance of resources—not to destroy, but to use and enjoy, and then to pass on to following generations. We are rapidly approaching a civil war of priorities—neighbor against neighbor, man against need—over the preservation or use of our resources. Bitter voices are raised, on the one side pleading, "Give us work, give us energy for our homes"; on the other side shouting, "Stop the destruction of our environment, protect our wildlife and our wilderness."

Somewhere in between there's a small voice that insists that if we do it right we can work together and respond to both needs. We cannot undo all of the wrongs of yesterday, but we can guide responsibly the needs of tomorrow. We cannot condone exploitation of one resource at the expense of another, but neither can we preserve untouched all of those resources that man needs.

All human needs must be taken into consideration, those of everyday necessity such as energy, as well as those of less tangible but equal importance such as scenic beauty.

In evaluating the entire situation regarding the trans-Alaska pipeline, I am convinced that we must make "use" and "conservation" compatible. As long as the Federal Government stands behind the strict environmental stipulations which we established for this project—to be the largest private engineering enterprise in the history of man—we can enjoy both the resources treasure and the wild grandeur of Alaska.

I have dreamed of the day when man would change his attitude toward the Arctic. There is vastness, untouched and primitive. There is beauty, peace, wealth and opportunity. A treasure chest of oil and other resources lies under the barren North Slope. At the same time, other vast areas of Alaska are of tremendous beauty, and promise to be an even more important resource for refreshing the spirit of man for as long as the human species inhabits earth.

Walter J. Hickel, a former Governor of Alaska, was President Nixon's first Secretary of the Interior.

STUDY FINDS RISE IN ESKIMO BIRTHS

56% in Canada Are Found Under 16 Years of Age

OTTAWA—The southerners' impact on the Eskimo shows up in things like poor teeth from candy and soft drinks and a fairly rapid change in his living habits, a Canadian research team has demonstrated.

Perhaps a more significant finding in the study of Eskimo response to a swiftly changing world was a greatly accelerated growth in population.

These preliminary findings were from Canadian participation in a five-year, four-nation study of Eskimo communities on the ancient migration route from Alaska to Greenland. The United States, France and Denmark were the other countries in the study.

The Canadian team studied the 735 Eskimos of Igloolik Igloolik is a coastal settlement on the northern tip of Melville Peninsula, which juts northward toward Baffin Island about 750 miles north of Churchill, Manitoba.

Some findings:

¶Physical and dental health is good with tuberculosis less significant than expected; no gross malnutrition, but poorer teeth among the children than the adults. The latter finding is attributed to soft drinks and candy introduced as part of a shift to western food.

¶The population under 16 years of age soared to 56 per cent of the total community, from 34 per cent in 1961.

¶Less than half live in summer camps, against 80 per cent in 1961, and they are increasingly moving into houses provided in a building program of the Northern Development Department.

¶Alcohol is not yet a serious problem in Igloolik, as it is elsewhere in Eskimo communities.

¶Only four Eskimos were classed as obese, attributed to biochemical disorders. Generally they remained muscular and stocky with a noticeable tendency to tan to almost black skin color in summer.

Dr. D. R. Hughes, a University of Toronto professor of anthropology who headed the Canadian team, said far more data had been collected than anticipated.

"Cooperation of the people of Igloolik was 100 per cent," Dr. Hughes said in a report to the National Research Council, one of five federal agencies and universities that supported the Canadian study.

ALASKA SIGNS PACT FOR PIPELINE ROAD

The New York Times

ANCHORAGE, June 19—After more than a year's negotiations, Alaska and a pipeline consortium of seven oil companies have agreed to terms for construtction of a 380-mile road on the petroleum-rich North Slope.

The State Commissioner of Highways,Bruce A. Campbell, and officials of the Alyeska Pipeline Service Company signed the deal that eventually should give the state a two-lane gravel highway that parallels the trans-Alaska pipeline route.

The company will pay for construction of the $200-million state when the pipeline is completed.

DEW line chaplains dean

By C.H. DARBY
Fairbanks Daily News-Miner
Dec. 29

The world is his parish, the arctic is his beat.

The man is the Rev. Paul H. Maurer, Dean of Chaplains for ITT Arctic Services Corporation on the 4,000-mile wide Distant Early Warning System stretching from Point Lay, Alaska, on the Bering Sea, across the top of the world, over the Greenland icecap and on to the east coast of Iceland.

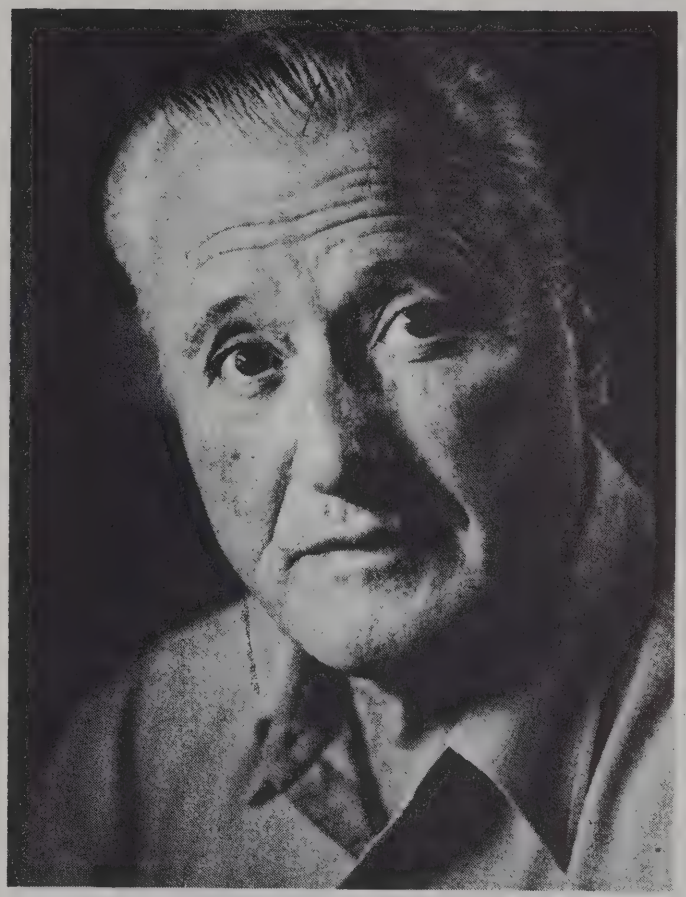
Seventy-two years old, though he looks no more than a healthy 50, the Rev. Mr. Maurer is probably the best known and best liked man in the system. Twelve years ago, he promised himself retirement at the age of 65. Today, he figures he is good for another 10 years or so, maybe longer.

"There is just too much work left in the world for me to do. The job is very, very satisfying, and I wouldn't know what to do with myself if I quit now."

He should be good at his work. Commissioned a chaplain, second lieutenant, by the Army in 1926, he served through two major conflicts, World War 2 and the so-called "police action" in Korea. From his 1950 post as chaplain of the 9th Army Corps, he somehow ended up at Fort Richardson in Anchorage where a love for the arctic regions and its peoples blossomed into his present civilian vocation.

In 1957, he retired from the military and a year later began his present job for the Federal Electric Company, then prime contractors to the Air Force on the Dew line operation. He was the first clergyman to make the complete trek across the arctic seacoast from the Bering Sea to the east coast of Iceland. Maurer was also the first member of the clergy to winter on the Greenland icecap when temperatures fell to more than 75 degrees below zero a great deal of the time.

In the years preceeding Alaska statehood, he was the last United States Commissioner of Barrow, Noatak and the Kobuk area while still holding down his regular job with Federal Electric.



The Rev. Paul Maurer

In 1960, his official parish consisted of Greenland and Iceland. Later he moved westward to Alaska and Canada, and at present covers the entire 4,000 miles from Liz Two, Point Lay, to the Icelandic coast.

The chaplain has no idea of how many thousands of miles he has traveled on his hundreds of trips across the top of the world. His normal length of stay at a site is from three to five days spent catering to the needs and problems of the men stationed there. He also travels extensively to religious seminars and conventions throughout the world. In July of this year he returned from a trip to Russia which lasted two months and before that spent considerable time touring Europe studying educational facilities there.

Maurer's prime interest is people, although his other interests are as wide and varied as the country over which he travels.

This year Maurer is spending Christmas at Barter Island and the village of Kaktovik. From his small, cramped quarters there, he somehow managed to send a total of 780 Christmas cards to friends around the world. At the same time, he counciled the men, assisted in choosing presents for their far-away families and is holding various religious services at the station.

"It's a good life, and a healthy one," he explained. "I'm very fortunate in having a certain talent for being adept in handling and helping men in remote and isolated areas. If He permits it, I'll be able to follow the calling for a long time yet. At least I hope so."

Railroad Has Butcher Crew

The Alaskan Railroad has a crew whose specialty is butchering moose that their trains hit. The meat is given to orphanages and other institutions, The Associated Press reports.

A British Scientist Says New Ice Age May Be on Its Way

LONDON (Canadian Press)—A British scientist says a new ice age may be on the way.

Dr. Thomas F. Gaskell, writing in Science Journal, rounds up information suggesting that the earth's climate is chilling and that another southward movement of ice from the northern polar cap may be starting.

The last one was in the Pleistocene period of around 1.5 million years ago when much of Canada was overrun.

Dr. Gaskell reports that early in the present century Artic glaciers were melting away rapidly, but since 1950 there is evidence tnat the earth has entered a cooling period.

"It is not certain," he adds, "whether these effects are merely statistical fluctuations of climate or whether they are the results of something man is doing to the environment.

"However, it is known that a swing of only 5 to 10 degrees centigrade in average temperature is enough to push the earth into an unbearably hot climate or an ice age.

"The present cooling down may mean that another forward movement of the ice is beginning."

He says that man may be affecting the earth's temperature by what he puts into the atmosphere.

"During the past 100 years," Dr. Gaskell writes, "there has been an enormous burning of coal and oil and it is conceivable that man is upsetting the balance of carbon dioxide in the atmosphere and oceans."

Alaskan Sea Otters Moved Southward to Help Species

NANAIMO, British Columbia (Canadian Press)—Fourteen sea otters from Alaska were released off the northwest coast of Vancouver Island after more than 25 of their fellows died in transit.

Biologists were hopeful that the 14, all in good condition, would survive the journey, the second major attempt in a year to replenish the species.

ESKIMO SYMBOLS TAUGHT IN ALASKA

Children Learning Alphabet Along With English

The New York Times

COLLEGE, Alaska, Jan. 30—A class of 15 Eskimo children, meeting in a small, yellow school building at Nunapitchuk in southwestern Alaska, has spent the first half of this school year learning a new alphabet for the language they and their families speak—the Yuk (pronounced yook) dialect.

They are the first members of a five-year pilot project in bilingual education introduced this year in three Bureau of Indian Affairs schools run by the state of Alaska. For all of these children, Eskimo is the first language, learned from the cradle at home, and English to them is a foreign language. Educators hope this new experimental language and curriculum will bridge the gap.

At the class in Nunapitchuk, two Eskimo teachers handle the classwork in conjunction with a white instructor. Other teacher teams work at Akiachak and Napakiak schools and at the state-controlled Bethel Elementary School.

Recently, the students gave a visitor dramatized presentations of "Goldilocksaaq Pingayun—Ilu Taqukaat (Goldilocks and the Three Bears) and an enthusiastic rendition of "Twinkle, Twinkle Little Star" in the same Yuk dialect, one of the two most widely spoken by Alaskan Eskimos.

For the class's teacher, Miss Marie Nick, this is a memorable occasion. Years ago, when she herself was a student in the same Eskimo village, she had to go without lunch as punishment for uttering a single Yuk word on the school ground.

While the two Eskimo teachers concentrate on Yuk, in the same school, a Caucasian teacher, Betty Perata, spends an hour a day indoctrinating the students in English. During this hour no word of Eskimo may be spoken.

Instead of "kavireliq" the students carefully chant in unison "red." Instead of "Uivik," they pronounce December. And in place of "Aipirin" they shout Tuesday.

A key partner in this program is the University of Alaska, cooperating jointly with the United States Office of Education through the Federal Bilingual Education Act and parallel state programs for Eskimo education.

The university's functions include training of native teachers to conduct the Eskimo language classes, development of an Eskimo grammar by the university's linguistics faculty and origination of a special bachelor of arts degree with a minor in Eskimo.

Dr. Bruce R. Gordon, head of the department of linguistics and foreign languages, said the University of Alaska was the only one in the country listed by a Modern Language Association survey as teaching Eskimo.

The next academic year, participants in this program may choose from courses in elementary Yuk; Inupiaq Eskimo, the dialect of natives in the Arctic; intermediate Eskimo with linguistic analysis of folklore material; preparation of teaching materials in Eskimo; a special topics course, and an Eskimo language workshop.

The new language developed by the linguistics department experts consists of 18 symbols, plus the apostrophe, borrowed from the English alphabet.

Miss Irene Reed, who has been influential in developing the curriculum, has eight natives, mostly part-time students, on the workshop payroll. Paschal Alcan, an Eskimo writer, artist and sculptor who is based here, has written a number of the 40 workshop books for children, either published or in the works, some of them illustrated in cartoon style by Andrew Chikoyak of the village of Tununak off the southwest coast.

"The Eskimos are a remarkably creative people," Miss Reed said. "The books, of course, are all culturally relevant but we deliberately do not exclude the outside world entirely. The Eskimos see it in the movies all the time."

"We intend that Eskimo will continue throughout the natives' lives as a meaningful language," Miss Reed said after a recent inspection trip to Nunapitchuk. She described the first four months of the program as a success.

"Some people have felt that the only goal of bilingual education should be to make these people as efficient as possible in English. I disagree. I don't think that should be the only goal. Competency in English does not have to be accomplished at the sacrifice of Eskimo."

The program first began at the university level in 1961, instituted by Dr. Michael E. Krauss of the University of Alaska. Recently, he remarked that the Soviet Union was far ahead of this country in developing textbooks for minority groups. He said texts had been printed in Eskimo in Siberia since 1932.

ICE BOX IS READY FOR ESKIMO TOWN

Walrus Freezer to Preserve Alaska Dietary Staple

By LAWRENCE E. DAVIES

The New York Times

COLLEGE, Alaska, April 28—An enormous "walrus freezer" will be dedicated for Eskimo residents Sunday on treeless, tundra-pocked St. Lawrence Island, a sentinel guarding the Bering Strait where the Pacific and Arctic Oceans meet. No longer will "selling ice boxes to Eskimos" be a joking matter.

The University of Alaska's Institute of Arctic Environmental Engineering here outside Fairbanks has supervised the design and installation of the wooden freezer tank, which is 55 feet in diameter and 12 feet deep at Savoonga, one of the insland's two principal villages of 400 residents each lying off Nome on the state's western coast.

The refrigeration facility, a pilot model, was developed to preserve a dietary staple, the mat of the walrus, from spoiling during the summer months. Saving the meat, half of which usually becomes putrid and inedible, will bolster the subsistence economy of the villages. The freezer has a capacity of 200,000 pounds, which figures out to about 100 maximum-sized bull walruses that dress out to a ton apiece, or of twice that many cows.

Eventually, university staff members foresee, similar ice boxes may be installed elsewhere in the Eskimos' arctic and Bering Sea hunting ground areas and even in interior villages where warm summer weather poses serious meat spoilage problems.

On St. Lawrence Island, 200 miles long and 20 miles wide, Eskimos rely on the ground's permanent frost for refrigeration, as do the Eskimos elsewhere in the Arctic. Families in the far north dig holes in the permafrost and there store their provisions—whale meat, walrus, seal. "Meat houses," frame structures sitting on the ground, have been used at Savoonga for many years.

"They protect the meat from the dogs," remarked Philip R. Johnson, the university environmental engineer who designed the new refrigeration system, "but are unable to preserve it and it slowly spoils during the summer."

This island, where Gambell, its other principal village, lies only 40 miles from the Siberian mainland, is a strategic place for the native family provisioner. The Pacific walrus herd migrates past St. Lawrence on its way north in May and June. The dedication of the new refrigerator, whose development, construction and installation of cost about $150,000, was timed as part of the two-day Savoonga Walrus Carnival, which marked the start of the annual walrus hunt.

The Eskimos' problem with walrus meat spoilage was called to the attenion of the University of Alaska in 1966-67 by Mrs. Gladys Mosgrove, then home extension agent at Nome for the university's Cooperative Extension Service. Mr. Johnson, a World War II Air Force navigator who stayed in Alaska to become a specialist in Arctic engineering, tackled the problem.

Since last fall heavy rainstorms, deep snowfall and temperatures as low as 35 degrees below zero have taxed the hardiness of the workmen—volunteer and paid Eskimos who had to do most of the excavating for the freezer with pick and shovel, removing a handful of frozen material at a time.

The artificial cooling system is designed to capture winter refrigeration capacity for use during the summer. It operates on the convection principle and uses 550,000 pounds of brine with a salinity of 11 per cent. This fills the lower part of the tank, below a platform on which families are to have individual meat storage bins. Additional bins provide for the village store and other requirements.

Iceberg Towed Three Miles

ST. JOHN'S, Nfld. (AP) — A group of engineers from Memorial University, using a chartered cargo ship, succeeded June 3 in towing an iceberg for three miles.

A university spokesman said Sunday the experiment, believed to be the first of its kind under controlled conditions, was part of a study to learn whether ships could be used to prevent drifting icebergs from colliding with offshore oil-drilling rigs.

The spokesman said the iceberg, taken in tow by the Percy M. Crosbie off Cape St. John on Newfoundland's northeast coast, was estimated to weigh 160,000 tons. The portion of the berg showing above water was 70 feet high.

A Senator Tells How Gas Canisters Sank in Lake

WASHINGTON, Jan. 6 (UPI) —About 200 canisters of nerve gas awaiting disposal sank unnoticed through melting ice of an Alaskan lake in 1966 and lay at the bottom three years before the Army tried to recover it, the office of Senator Mike Gravel, Democrat of Alaska, said today.

A Deadly Gas

The gas was described as type VX, and is said to be so deadly that a single drop on the skin can kill a man.

Mr. Gravel's office was advised by the Army that none of the gas escaped from the containers.

It was recovered in 1969 after a new commanding officer of Fort Greely, in Alaska, investigated rumors of missing gas, the Senator's office said. This was done by draining the lake.

The gas had been placed on ice covering the lake in a remote section of the Gerstle Testing Area of Fort Greely in early 1966. The gas had been set for disposal later and the canisters had even been fused for demolition.

When a spring thaw occurred in May of that year, Mr. Gravel's office related, the ice gave way and the canisters slipped to the bottom.

No one apparently noticed that they were missing for some time, the Senator's office said, and nothing was done to find out what happened until late 1968.

His office made public details of the Army investigation of the incident, which the Senator requested.

No Record of Discovery

The draining of the lake began May 6, 1969 and the neutralizing of the gas began on Aug. 7. There was no record of when the gas was discovered on the lake bottom.

The Army report said disposal of the gas was completed Sept. 18, 1969.

The New York Times Jan. 7, 1971

Nerve gas sank at cross

ESKIMO IGLOOS VIE WITH FRAME HOUSES

WASHINGTON—It is hard to beat an igloo for economy, simplicity, and speed of construction.

A skilled Canadian Eskimo couple can build one in less than an hour, complete with skylight, using only a simple bone knife.

The dome-shaped snow houses still are widely used in the central and eastern Canadian Arctic, but their days appear to be numbered. Frame houses rise in many Eskimo communities, and tents are more popular than igloos on hunting and camping trips.

The igloo never caught on with Alaskan Eskimos, although they occasionally improvised snow shelters on hunting trips.

Traditional igloos are made from blocks of compressed snow fashioned into a circular structure, the National Geographic Society says.

Once the snow-block beehive is up, cracks are sealed with loose snow. A chimney allows warm air from oil lamps to escape and prevents the house from settling round the occupants' shoulders. Most of the melting water runs down the rounded sides instead of dripping.

RICHFIELD REPORTS OIL FIND IN ALASKA

The Atlantic Richfield Company announced Feb. 24 a "significant" new oil find 25 miles west of the Prudhoe Bay State No. 1 discovery well on the North Slope of Alaska. Robert O. Anderson, chairman, said the company's exploratory well, the West Sak River State No. 1, has encountered oil sand in the upper Cretaceous formation in a 340-foot interval from 3,745 to 4,085 feet on acreage wholly owned by the company.

Mr. Anderson said that this marked the first time that oil sands of this thickness had been found in the upper Cretaceous formation on the North Slope.

On drill-stem tests, the approximately 18-degree American Petroleum Institute gravity oil flowed into the well bore but not to the surface and no gas was associated with the oil. Mr. Anderson said this meant that oil of this gravity would probably require pumping for production.

Atlantic Richfield drilled the original Prudhoe discovery well in a joint operation with the Humble Oil and Refining Company.

Alaska Fur Seals Thrive

The Alaska fur seal, once in danger of extinction, is thriving under the protection of the department of the Interior's Bureau of Commercial Fisheries.

Early in this century, fur seals, hunted indiscriminately for their valuable pelts, were in danger of becoming extinct, says the Wildlife Management Institute.

The Alaska herd was actually reduced to about 200,000 seals. Today the Pribilof Island herd alone numbers in the neighborhood of 1.5 million seals. This is considered the maximum rookery level for the island without overcrowding.

Dr. Leslie L. Glasgow, assistant Secretary of the Interior for Fish, Wildlife and Parks, says the Alaska seal has a male and female birth rate in equal numbers. Each breeding bull gathers an average of 40 females in his harem. Therefore a large number of non-breeding males between three and four years old can be harvested for their valuable pelts.

The harvestable males may be taken easily without disturbing the breeding population because they occupy a separate area of the rookery.

Besides preventing disease losses and increasing the fur seal production, the Interior Department pointed out that the annual fur harvest provides almost the sole economic support of two aleut communities on Pribilof Island.

PROJECT HELPS SAVE ARCTIC POLAR BEARS

At least 450 polar bears are roaming the Arctic as a result of an international research program for this endangered species, directed by the Polar Bear Group of the Survival Service Commission, Oryx, the organ of the British Fauna Preservation Society, reports.

At its first meeting in 1968, the group standardized research techniques for marking bears—ear tags, dye, lip tattoos—and new methods are now being tried, including radio tracking and counting by heat-sensitive scanners on aircraft.

All this is in order to get the facts about the polar bear's life history that are essential for devising management plans.

Threats to the bears increase, especially through economic developments in the Arctic—oil spills and offshore drilling, for example, which can have serious ecological effects. And there is still a growing market for polar bear skins. In addition, Eskimos, who use the bears for food and clothing, are increasing in numbers.

A Tracked Carrier Works As a Fire Truck in Alaska

A tracked carrier has been converted into a fire truck to meet the unique needs of isolated Barrow, Alaska, the northernmost town in the United States, the Fleet Owner magazine reports.

Barrow's volunteer fire department had planned to buy a regular wheel truck to supplement equipment available at a nearby Air Force station. But the chief, Tom Opie, realized that a wheeled vehicle would be useless in heavy snow.

As a result, the volunteers obtained a 22-foot caterpillar-type carrier, on which they mounted a water tank, hose reels and a pump. The vehicle is housed in a heated garage, with the water tank filled. When answering a call in cold weather, the pump keeps the water moving, preventing freezing.

Mild Gold Fever Hits Nome

NOME, Alaska (AP) — Gold fever struck this former gold-rush town when the board sidewalks were torn up to make way for a concrete walk. It did not take youngsters long to discover the bonanza — thousands of coins that had been lost under the boardwalk over the years.

Dark Season Brings Sluggishness to Arctic Town

By EDWARD COWAN
The New York Times

INUVIK, Northwest Territories, Dec. 6 — The sun made a pale 18-minute appearance today and then set for a month. The dark season is at hand.

In early December, the darkness of night persists until 11 A.M. A visitor whose jet airliner arrived after midnight awoke at 10:30 A.M. startled to find the world still dark, street lights and auto headlights still on.

Barring overcast, full daylight arrives by early afternoon. A rosy red may even tinge the southern sky, a reminder that there still is a sun. By the time school children go home at 3:30, the light is fading.

Old-timers say that the dark days don't affect them and that they get up on winter mornings without special difficulty. The hundreds of geologists, teachers, civil servants, oil drillers and others in their first or second season in the booming Western Arctic may feel sleepy in the morning and sluggish all day. Many say they sleep more in winter.

"The body seems to slow down, people tend to hibernate," said Tom Butters, publisher of The Drum, a weekly newspaper.

"What makes us depressed," said Agnes Semmler, who is half Indian, "is to have to stay on a job in the shop when spring comes. I like to get out, to hunt or fish."

Agnes Semmler is 59 years old. Every June, when daylight around the clock interferes with the sleep of newcomers, she takes her vacation from the Government-sponsored native crafts shop she manages and goes muskrat hunting in the Mackenzie River delta.

She and her husband, who runs a general store that is a throwback to a fur trading post, don't need the money from the muskrat pelts. But a lot of Canada's Eskimos and Indians "still get their table food from hunting, fishing and trapping," said Raymond H. Pelletier, manager of the newly opened Canada Manpower office here.

"That is why they leave a job," Mr. Pelletier said. "If they don't go out hunting, there's no food for the table."

What natives earn at their jobs, he added, is for "entertainment." Inuvik, with a population of 3,080, has one movie hall, two bars and a liquor store.

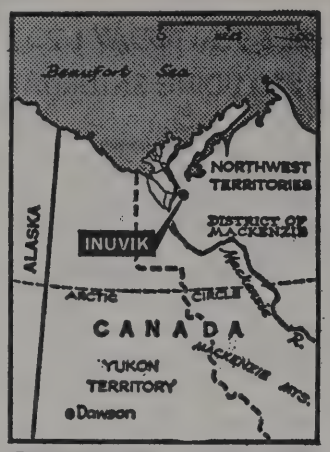
The reputation of the Eskimo and Indian for leaving a job to fish or trap, or simply when he has earned enough money to cover his immediate needs, is one reason Canada's Arctic oil exploration boom creates more jobs for whites from the south than for Eskimos and Indians.

Another reason, perhaps a more important one now that the Canadian Government is pressuring oil and mining companies to hire and accommodate natives, is lack of education and skills. Government and industry are attempting in the classrooms and on the job to overcome that deficit.

The effort starts early in classes like that of Beverley Geisler in the Sir Alexander Mackenzie School. Mrs. Geisler has 10 Eskimo "beginners," children five to seven years old who aren't yet ready for grade one.

The number of natives in skilled jobs grows each year, but so does the Northern labor force, and probably faster.

The natural-gas industry hopes to start bringing in supplies next year for construction of a pipeline from Prudhoe Bay, Alaska, southward through the Mackenzie River Valley. Ottawa has just speeded up the building of the first road to the Arctic, through the Yukon Territory, to be finished in 1974.



The New York Times Dec. 13, 1970

ESKIMOS' CHILDREN ARE GROWING TALLER

EDMONTON, Alberta, Feb. 27 (AP) — Eskimo children are growing two to five inches taller than 30 years ago because they are consuming more sugar, according to a Government medical researcher.

The researcher, Dr. Otto Schaeffer, reported that his studies also indicated that the increased sugar intake by Eskimos had increased the birth rate. As more Eskimos abandoned the life of nomadic hunter and fisherman, and established communities, they consumed more soft drinks, candy and other forms of sugar.

Dr. Schaeffer said that growth acceleration had been noted in many developed countries over the last century, but it has been attributed to a higher protein intake. There has been a "marked decrease in protein consumption" by the Eskimos, Dr. Schaeffer said.

"This type of growth acceleration seen in developed countries and now documented in the Canadian Eskimo, occurred likely not due to a supply of the previously missing 'building stone,' but rather by addition of a new and unnatural nutrient-sugar," he said.

Land Controls for Arctic Set

OTTAWA, June 19 (AP) Stiff controls on land exploration in the Northwest Territories and the Yukon were announced Saturday by Canada's Northern Development Department.

Designed to protect the Arctic environment, the regulations affect all exploration to be carried out in the Canadian north by oil, gas and mining companies.

The companies are given 42 days to study the regulations and present suggestions for possible changes. But the department aims to put the regulations into effect in time for winter's operations.

CARIBOU IN CANADA HAVE WANDERLUST

WASHINGTON—Caribou are always on the move. In April and May, along the edges of Canada's Arctic tree line, the animals mass for their migration toward the lichen-rich tundra.

Today only small bands emerge from the scrub, then mill about with others on the frozen lakes and head north, the National Geographic Society reports. Caribou once pounded over the ice in throngs measured by the square mile.

Nature held the caribou population in check until advancing civilization almost wiped it out. Repeating rifles turned hunts into massacres.

Both coastal and island hunters still stalk the caribou as a source of meat and skin for bedding and clothing. The hollow hairs on the animal's coat insulate far better than any fabrics.

A 1949 aerial survey in Canada showed that the caribou, a first cousin of the European reindeer, had declined to about 368,000 — one-third of their number in 1900. The present population has stabilized at approximately 387,000.

The hardy caribou adapts to places where relatively few other species survive. An oily side covered with air-filled hairs provides a heavy winter overcoat and a built-in life jacket that enables the animal to outswim most predators. Broad, cleft hoofs act as snowshoes to speed it over bogs and snow drifts.

ESKIMOS ARE TAUGHT ABOUT FISH-FARMING

LAKE CHARLOTTE, Nova Scotia (Canadian Press) — Training two Eskimos in the art of fishing may seem like bringing coals to Newcastle, but it is actually part of a plan to start a new industry in the Arctic.

David Lucas, 20 years old, and Willie Tomassie, 23, from Payne Bay, on Ungava Bay in northern Quebec, are learning about the operations of Sea Pool Fisheries, Ltd.'s, commercial fish farm at nearby Clam Bay, 40 miles east of Halifax.

When they finish their on-site training, they will return to Payne Bay to establish a base from which to ship Arctic char eggs to the commercial fish hatchery in Nova Scotia.

Sea Pool Fisheries' commercial hatchery is the first of its kind in Canada, a company spokesman said. When it is in full operation, it expects to produce more than two million pounds of rainbow, steelhead and hybrid trout and Atlantic salmon a year for Canadian and United States markets.

P. E. Cavanagh, president of Sea Pool Fisheries, said that the advantage of "sea farm fish was that they would grow 250 times as fast as those raised in natural surroundings.

Controlled conditions enable the production of fish of a uniform size and weight. From Nov. 1 to May 1 each year, the fish will be raised in heated sea pools to aid growth.

Hopes for a Vast Oil Pool Blaze in Canadian Arctic

By EDWARD COWAN
The New York Times

CALGARY, Alberta, Nov. 29 —On King Christian Island, 800 miles north of the Arctic Circle, a fountain of flame spurts 200 feet into the air, day and night.

It is a natural gas well that blew wild and caught fire on Oct. 25.

The glow from the combustion of an estimated 42 million cubic feet of gas a day can be seen for 200 miles in the semi-darkness of the Arctic's winter midday, oilmen have reported. It has become a regular sightseeing feature for passengers on polar-route jets.

In Calgary, Canada's oil capital, the gigantic torch is regarded as strong new evidence that buried beneath the islands and sea ice of the Canadian Arctic are vast pools of oil and gas—perhaps enough eventually to rival the Middle East or at least to diminish its economic and political importance to Japan, Europe and North America.

That, however, is a distant and tentative possibility. Even if tens of billions of barrels of oil are found, the delivery challenge must then be solved. No one is sure now whether pipeline, tanker ships (surface or submarine) or perhaps even self-propelled dirigiblelike balloons would best overcome the natural hazards of the region at an economic cost.

A pipeline would require new technology to protect the pipe against massive ice pressures. Such a delivery system, it is said, probably would soak up more capital than has any single industrial project except the space program.

King Christian was the second Arctic island gas strike by Panarctic Oils, Ltd., a consortium in which the Canadian Government has a 45 per cent share. Last year, 200 miles from King Christian Island, Panarctic found gas on Drake Point, Melville Island. That hole also blew wild, and it was finally plugged.

Both strikes were considered promising of oil, the prize for which more than $100-million is being spent in the Arctic by Canadian, American, British, French, Belgian, Italian, West German and Dutch companies.

So far, no one has struck an oil well on the islands, although there have been some trivial oil shows. On the mainland, Imperial Oil, Ltd., had a discovery well at Atkinson Point 11 months ago, a promising sign, and a large field was found in 1968 at Prudhoe Bay, Alaska.

The New York Times Nov. 30, 1970

Of King Christian, Charles R. Hetherington, Panarctic's president said in an interview this week:

"We're really enthused by this discovery. It's too bad the thing had to blow out on us, but it's better than a dry hole. We were a few feet into the sand and—whammo—we found hydrocarbons, which is a very good sign."

The drilling bit encountered sand with high porosity, a high capacity for holding hydrocarbons and water, at about 2,000 feet.

From seismographic data, it has been inferred that laterally the field measures 20 miles by 5. Its depth is the critical unknown. Oilmen who have visited the site have speculated that the gas-bearing zone may be 2,000 feet thick.

The answer won't be known for months, until a slant hole is finished, the fire is put out with sand and water and new holes are drilled.

The initial rig was destroyed by a fire, a loss of about $750,000. Bringing the wild well under control will cost $2-million, Mr. Hetherington said.

The Government announced this week that it would investigate. There were no casualties on King Christian, but the blowout of a second Panarctic gas well had oilmen shaking their heads. It was as if a shortstop had bobbled two easy ground balls in the first inning of a World Series game.

Mr. Hetherington said Panarctic had discharged one of its supervisors for failure to follow procedural instructions and had told the contractor, Commonwealth Hi-Tower, to get rid of two of its men. The dismissed man has said he was being made a scapegoat.

If the King Christian "pay zone" is 2,000 feet thick, it may hold up to 50 trillion cubic feet of gas, Mr. Hetherington estimated. That would make it the largest field in North America but smaller than the Groenigen field on the North Sea coast of the Netherlands and smaller than estimated Soviet fields.

Nevertheless, at a hypothetical wellhead price of 10 cents a thousand cubic feet, 50 trillion feet would yield $5-billion in revenue.

As a revenue figure that sum may be surrealistic, but if it were released as the capital cost of a delivery system it might not be. Mr. Hetherington cautiously estimated a pipeline 2,100 miles southward to the United States border would cost $2-billion to $4-billion.

Although the sea route is not in "iceberg alley," Mr. Hetherington said, the pipeline—which would be a record 60 inches in diameter—would have to be buried where the water is shallow to protect it from drifting ice ridges, which bear down with a force of tens of thousands of tons.

Transport costs might add 70 or 80 cents a thousand cubic feet to the price of the gas. The average price for natural gas at the gates of American cities now is about 40 cents.

Canadian Eskimo Has A Hand in Golf Trophy

MONTREAL, June 19 (UPI) —An unusual award will be presented for the first time this year to the winner of the $150,000 Canadian open golf championship, to be held July 1 to 4.

The top of the trophy is a specially selected Eskimo soapstone carving mounted on a wooden base. The bottom is made of laminated Canadian ash, with 12 hand-carved maple leaves on front and back.

The trophy weighs 45 pounds and is 2½ feet in width and 2 feet in over-all height.

The soapstone carving was done by Simmon Kasadluak, a 43-year-old Eskimo who lives with his wife, Jeela, and their 5-year-old daughter at Inoucdjounac in the Hudson's Bay region. Officials said they planned to choose a new Eskimo carving every year.

STUDY OF ESKIMOS IS BEGUN IN CANADA

A major five-year study of the genetics, physiology, pathology and ecology of the Eskimo is under way among the 735 residents of the Igloolik region, a remote community near Baffin Land, 750 miles north of Churchill, Maniteb, the United Nations Educational, Scientific and Cultural Organization reports.

Scientists from Canada, the United States, France and Denmark are cooperating with the studies being conducted within the framework of the International Biological Program. This program involving 60 nations, is concerned with fundamantal research into the problems of biological productivity and human survival in a world undergoing rapid technological change.

The Eskimo study involves three communities lying along the ancient migration route from Alaska to Greenland. The Canadian committee selected Igloolik as the site for Canadian participation in the multinational study of the Eskimo's ability to adapt in a swiftly changing world. The study was approved by the Igloolik Eskimo Council before it began.

Preliminary Canadian results show that the Igloolik Eskimos are in good physical health. Among other findings, is the fact that there are hunters among the eskimos with visual defects needing glasses.

High Prices Lead Eskimos To Raise Chickens and Pigs

YELLOWKNIFE, Northwest Territories (Canadian Press)—Canadian Eskimos usually eat whales and caribou, and do not care much for the white man's diet. By Eskimo standards, prices are generally prohibitive for beef and pork anyway.

However, as a result of an experiment by the Northwest Territories Department of Industry and Development, some Eskimos in the Far North have pork, chicken and eggs available at reasonable costs.

A fish-canning plant at Rankin Inlet, 900 miles north of Winnipeg, Manitoba, had a lot of fish left over after using the fish fillets and steaks. It brought in a few pigs and chickens to see if they would be able to eat the high-protein remains.

The pigs and chickens flourished on the diet, says E. A. Ballantyne, chief of the department, and egg and pork production has become a sideline at the settlement.

SEARCH FOR FRANKLIN: by L. H. Neatby, 280 pp., Edmonton, Hurtig, $7.95.

OF all the explorers who ventured into the icy waters of the Arctic, there is none who caught the imagination of the world so much as the tragic figure of Sir John Franklin. Of all the books on the much-chronicled search for Franklin there can be few that have captured the excitement and scope of this most important period of Arctic exploration as well as this new work by Professor Neatby. The many expeditions, the courage of the men who led them, the successes, the failures and the hardships are all here in this fascinating and scholarly book.

Franklin, naturally, is the central figure, but Professor Neatby has not confined himself to only one explorer. Here also, for example, is James Ross, who eventually challenged the Arctic ice packs five times and pioneered the explorer's art of sledging. Parry, Simpson, Rae — Professor Neatby offers us the full panorama.

Franklin himself was a remarkable man. At the age of 14, in the Royal Navy, he witnessed the bombardment of Copenhagen. Later, after being shipwrecked on the Australian coast, he returned to England in time to participate in the Battle of Trafalgar. At the end of the Napoleonic wars he was appointed to the service in the Arctic regions of Canada. His first two expeditions between 1819 and 1827 were overland and resulted in the mapping of 1,800 miles of Arctic coastline.

In this same period there was fervent activity in the Polar Seas as the British admiralty sent out five separate expeditions whose discoveries added considerably to the knowledge of Arctic geography. Several private expeditions followed and by 1840 the charting of the northern seaboard from the Bering Strait to the Isthmus of Boothia was complete.

By 1843 the pride of England, and the agitations of both the Royal Society and the Arctic explorers had revived an interest in the North West passage. Britannia was not about to let another nation claim the glory of discovery of the passage, and so it was, in 1843, that Franklin set out in two ships, the Terror and the Erebus, on his ill-fated final voyage.

After the ships had been gone for two seasons without any word having been heard from them, the search for Franklin began, a search that was to unravel "by far the greater part of the Canadian archipelago" and inaugurate "the thrust that in half a century was to carry the Stars and Stripes to the North Pole."

In 1849 the search began. Its magnitude is indicated by the men who led the expeditions. Pullen, Collinson, McClure and McClintock entered the Arctic from the Bering Strait and worked their way west; Kennedy, Bellot, Ross, Belcher, De Haven and Kane entered from the west and moved east. Three of these expeditions were sponsored by Lady Franklin herself, the last of them led by John Ross, who at the age of 73 was completing his 26th year as an Arctic explorer.

In spite of this flurry of activity, it was not until 1854 that the world learned of Franklin's fate. In that year, Dr. John Rae, on a scientific expedition, met with some Eskimos who told of a large number of white men staggering ashore and dying, one by one, of starvation and exhaustion. European goods, definitely from the Terror and Erebus, proved beyond doubt these were Franklin and his men.

In the winter of 1857-1858 McClintock, in search of further information, discovered a cairn at Victoria Point that contained a record of the Franklin expedition. The record told how the ship had become ice-bound in 1846, that Franklin had died on June 11, 1847, and on April 26, 1848, his men had abandoned the ships and gone overland in an attempt to reach Hudson's Bay Co. posts to the south.

This much is known; the rest is still shrouded in mystery. Franklin's ship logs have never been found and his course never positively traced. Franklin did, however, achieve his goal to a large extent. He discovered "a" northwest passage and almost succeeded in sailing through it.

Professor Neatby's book is an excellent chronicle of these events, of Arctic exploration and the hardships of Arctic life. It is apparent that many of these expeditions would have been complete failures without the help of the Eskimos and northern Indians. This aspect of Arctic exploration has never been properly documented. Fortunately, in his book Professor Neatby gives it better coverage than it is usually accorded.

Winnipeg Free Press

By DR. FREDERICK SHROYER
Herald-Examiner Literary Editor

ACROSS THE TOP OF THE WORLD, by Wally Herbert. Putnam, $7.95.

There are still among us men driven by a thirst for adventure, men who must risk life and limb to climb a mountain simply because it is there. Among this hardy breed stands, proudly, Wally Herbert.

Obsessed by a dream and a vision of possibly false, impossible shores, Herbert, three comrades, and a pack of dogs left Point Barrow, Alaska, and 467 days later, in 1969, reached Spitzenberg, having, on their way, dropped by the North Pole to pay their respects. They had quite literally walked across the top of the earth, and in doing so had left their mark upon almost 4000 miles of hostile, frozen earth and murderous waters. Having accomplished the longest journey, in time and distance, in the history of polar exploration, they ended it, somehow, reasonably intact.

For more than 15 months, the members of The British Trans-Arctic Expedition — for so the adventure was called — were menaced by just about everything the elements were capable of throwing at them: Moving, melting ice which cracked thunderously, not infrequently at the very edges of their shoes, fire which destroyed much of their equipment, vast stretches of unrelieved night, and temperatures that plummeted into near-extinction. And then there were polar bears — which were encountered, dangerously, much closer to the Pole than had previously been suspected. Finally, there were always present the nameless fears that prowl the minds of men who are lonely and isolated, fears no less disturbing for their insubstantiality.

"Across the Top of the World" is good travel adventure, and the mad enthusiasm, the irresistible drive that drove Herbert into it is contagious and quickly afflicts the reader. Subtitled "The Last Great Journey on Earth," this record of a quest perilous may indeed be that, for eventually the vast white land upon which it was made will, one fears, succumb to the filth that accumulates across and on the rest of the globe. But when all terrestrial places for suitable adventures have been tamed, and when the Pole itself has been toppled, such books as "Across the Top of the World" will remain to remind the reader of what he once had, and to bring vicariously what he was into his experience again.

THE ANTARCTIC by H. G. R. King ;Arco Publishing Co.; $9.95.

Although this comparatively short, 276 page volume is crammed with too many technical details for the general reader, it is an invaluable addition to the library of the naturalist or anyone who wants to understand the phenomena of the deep-freeze, south polar region.

H. G. R. King, information officer for the Scott Polar Research Institute of Cambridge, England, devotes much space to the wildlife of the Antarctica, the seals, the penguins, the fish, the whales and their threatened extinction, and the rich plankton supply of the seas surrounding the vast ice shelves of the Antarctic, a surprising food source which a protein-hungry world may some day tap.

One amazing fact which becomes apparent in the text is that this cold storage area of 90 per cent of the world's ice and snow, a reservoir of fresh water equal to the Atlantic Ocean, may some day be opened up as a source of water which could make the deserts of the world bloom.

Although this massive region's frigid weather is inhospitable, the ice and snow-covered land, the stark, barren mountain peaks, the gigantic ice floes and many strange geographical features make the land visually magnificent, a point accentuated by 310 photographs, 67 of them in full color.

—David Deas
SACRAMENTO BEE

Alaska Oil Well Tested

The Atlantic Richfield Company announced May 10 that its West Sak River State No. 1 well on the North Slope of Alaska flowed 1,340 barrels of 21-degree gravity oil from a test made with a three-quarter-inch opening. The well is 25 miles west of the Prudhoe Bay State No. 1 discovery well.

Bodies of General and Wife Found in Wreckage of Plane

The New York Times

LOS ANGELES, June 7 — A retired Air Force general and his wife were found dead today in the wreckage of their light plane in a rugged mountain area 60 miles northwest of Los Angeles.

The victims, identified as Maj. Gen. Richard O. Hunziker, 54 years old, and his wife, Margaret, disappeared a week ago on a pleasure flight from Calexico, Calif., on the Mexican border, to Santa Barbara, near their home at Carpinteria, Calif.

The bodies were found strapped in the wreckage of the Cessna 182 on a wooded slope of Hines Peak in the Sespe National Wildlife Area, about 40 miles short of the victims' destination.

Civil Air Patrol searchers reached the wreckage this afternoon after it had been sighted from the air by a commercial airline pilot. The search party reported that the plane had not been badly damaged, and identification of the victims was made from papers found with the couple.

The cause of the crash was not immediately determined. It was to be investigated by the National Transportation Safety Board, which checks on all domestic airplane accidents.

The search for the couple had spread over six counties. It had been hampered because General Hunziker, a World War II fighter pilot who had logged more than 6,800 hours of flying experience, had neglected to file a flight plan with the authorities.

At the time of his retirement in 1969, General Hunziker was the deputy inspector general at Norton Air Force Base in San Bernardino, Calif. From 1962 to 1965, he was vice commander of the First Strategic Aerospace Division at Vandenburg Air Force Base, near Santa Barbara.

As Deputy Chief of Staff for matériel of the Strategic Air Command in January, 1968, General Hunziker was in charge of the recovery of four hydrogen bombs lost in the crash of a B-52 bomber near Thule Air Base in Greenland.

Parts of the weapons, which had broken into fragments in the crash, were recovered. The weapons, each with an explosive force equivalent to 1.1 million tons of TNT, had been unarmed.

The Danish Atomic Energy Commission and the United States Air Force, in a report following an investigation, said the accident had presented no danger to life in the area. In a foreword to the report, General Hunziker wrote: "The seemingly insurmountable task of recovering and removing all traces of the accident proved again that truth may be stranger than fiction."

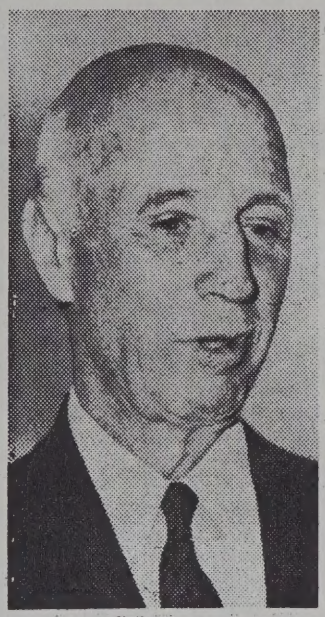
Rockwell Kent, Artist, Is Dead

The New York Times

PLATTSBURGH, N. Y., March 13 — Rockwell Kent, whose rugged landscape paintings and memorable book illustrations won him an international reputation, died in the Champlain Valley Physicians Hospital Medical Center today after having suffered a stroke earlier this month.

A prolific artist who often espoused controversial leftist political causes, Mr. Kent was 88 years old and lived in nearby Ausable Forks.

Wanting to go to Alaska to paint the mountains and the sea and the wilderness, he had himself incorporated in 1916 as Rockwell Kent, Inc., and sold shares to his friends; and with the proceeds he managed to live for a year on Fox Island, in Resurrection Bay. His products—oils and black and white drawings — were exhibited in 1920 and created a sensation for the vivid impression they conveyed of the cold north wind, the chill of the sea and the barrenness of the rocks. The works sold well, enabling Rockwell Kent, Inc., to pay a 20 per cent dividend. Sales also permitted the artist to buy out the company and to dissolve it.



United Press International
Rockwell Kent

The Alaska art, moreover, created a demand for his illustrations, some of which he did in his own name and some as Hogarth Jr. Under that pseudonym he did satirical and humorous drawings for Vanity Fair and other magazines as well as commercial art work, including advertisements for Rolls-Royce motor cars. But wanderlust again afflicted him, and in 1923 he beat his way around Cape Horn in a small sailboat and spent a year in the desolation of Tierra del Fuego.

Mr. Kent's illustrated account of his adventures, "Voyaging Southward From the Strait of Magellan," won him fresh acclaim. After a pause of six years he voyaged to Greenland. His chronicle of that trip, which included a shipwreck, was published (with his illustrations) as "N by E" in 1930 and was widely distributed by the Literary Guild.

In the thirties he wrote and illustrated "Salamina," another book about Greenland, to which he returned in 1931 and 1934, and did the illustrations for his edition of Shakespeare and other classics.

In the forties and fifties Mr. Kent continued to paint, to draw and to write. His lengthy, lushly written and extroversive autobiography came out in 1955, and "Greenland Journal," an account of his 1931 trip to that island, was issued in 1962.

Ivan Cherevichny, 61, Pilot Of Soviet Convoys in Arctic

MOSCOW, Feb. 18 (Reuters) —Ivan Cherevichny, arctic pilot, has died at the age of 61, the Soviet press agency Tass reported today. A hero of the Soviet Union, Mr. Cherevichny escorted convoys of ships through ice floes, flew to remote Arctic stations and took part in rescue operations in the extreme north.

In 1938, Mr. Cherevichny flew one of two planes that rescued four Soviet scientists on a drifting ice floe off Greenland.

He also participated in the Soviet expedition to Antarctica in 1956.

EJNAR MIKKELSEN, ARCTIC EXPLORER, 90

COPENHAGEN, May 5 (AP)—Capt. Ejnar Mikkelsen, Danish Arctic explorer and author who joined his first expedition at 19, died Tuesday night at his home in Copenhagen. He was 90.

Capt. Mikkelsen went to sea at 14 and joined the international expedition to East Greenland in 1900. He was a member of the Baldwin-Ziegler polar expedition of 1901-3 and chief officer of the international hydrographic expedition to the North Atlantic in 1903-4.

He rapidly gained a name in international explorer circles and was named to head the Anglo-American expedition to North Alaska in 1906-8. He led a three-year expedition to East Greenland that began the following year.

In 1909 he spent almost two years on Greenland's northeast coast after losing his boat and most of the gear. Capt. Mikkelsen and a Danish companion had attempted to find the bodies of another Danish-led expedition, Mylius-Erichsen, which perished in 1907.

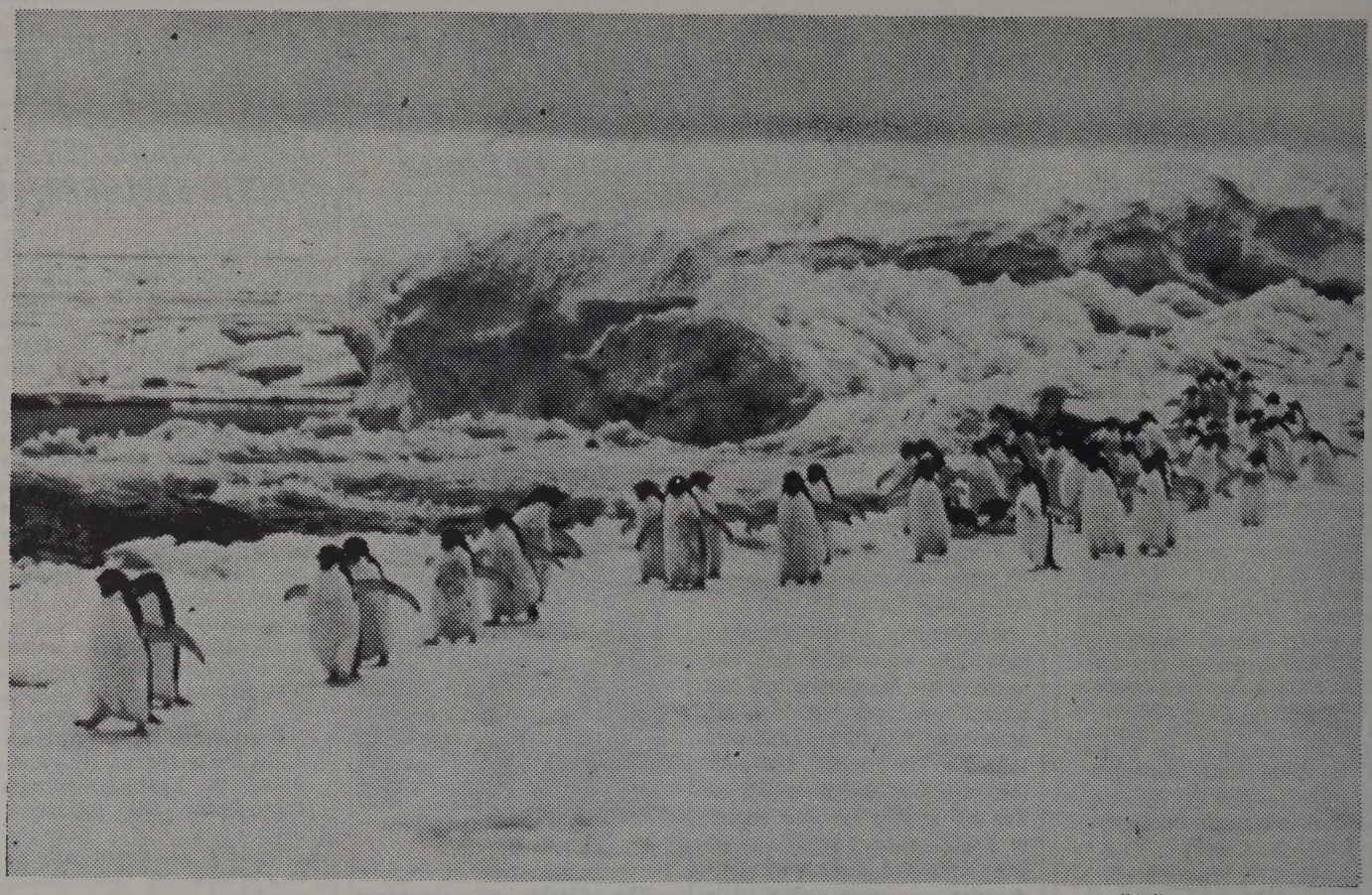
In the 1920s, Capt. Mikkelsen took an expedition to the Arctic and led an experimental fishing cruise to West Greenland. He was manager of the Faroe Whaling Co. from 1927-30 and was appointed inspector general of East Greenland in 1934.

During World War II, Capt. Mikkelsen was adviser on Greenland to the Danish Embassy in Washington.

Capt. Mikkelsen was a Knight of Dannebrog, the highest Danish honorary title, and was awarded many international honors including medals from Danish, British, French, Belgian, American and other geographical societies.

Among his books were "Conquering the Arctic Ice" (1908), "Lost in the Arctic" (1913), "Frozen Justice" (1920), and "The East Greenlanders, Possibilities of Existence" (1947).

He wrote a number of other works on Greenland and Eskimo life.



U.S. Navy

SUCH A NICE DAY, THEY DECIDED TO WALK: Adelie penguins on a field of ice at Cape Byrd, Antarctica. They are among limited animal inhabitants available for study by scientists and U.S. Navy in Operation Deep Freeze.

UN TV camera crew at the South Pole. Raising the flag are Pierre Desbonnet and Martin Bunnel who also appear with friendly (?) seals